GM UPFITTER INTEGRATION

2015 CHEVROLET CITY EXPRESS CARGO VAN

Body Builders Manual

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FOREWORD

This manual contains body builder's information for the 2015 Chevrolet City Express Compact Cargo Vehicle. In order to assure your safety and the efficient functioning of the vehicle, this guide should be read thoroughly. All information in this guide is based on the latest product information at the time of publication. The right is reserved to make changes in specifications and methods at any time without notice.

IMPORTANT SAFETY NOTICE

The proper performance of procedures is essential for both the safety of the technician and the efficient functioning of the vehicle. The methods in this Body Builder's Guide are described in such a manner that they may be performed safely and accurately. Methods vary with the procedures used, the skills of the technician and the tools and parts available. Accordingly, anyone using procedures, tools or parts which are not specifically recommended by General Motors and/or the OEM must first be completely satisfied that neither personal safety nor the vehicle's safety will be jeopardized by the method selected.

DISCLAIMER

All information, specifications and illustrations in this manual are those in effect at the time of printing. General Motors and/or the OEM reserves the right to change specifications or design without notice and without obligation. The body builder, conversion company, aftermarket equipment manufacturer, second stage manufacturer, upfitter, dealer and the vehicle purchaser are responsible to abide by the regulations issued by the National Highway Traffic Safety Administration (NHTSA), the Occupational Safety and Health Act (OSHA), state, local, or provincial government laws. These regulations and laws may require the installation of additional equipment for the intended vehicle uses.

GENERAL INFORMATION

Important Regulatory Information

Emission standards and motor vehicle safety standards for new vehicles and equipment have been established by the United States and Canadian Governments under the provisions of the Clean Air Act, the Noise Control Act, and the National Traffic and Motor Vehicle Safety Act in the U.S., and the Canadian Motor Vehicle Safety Act in Canada.

These Acts govern General Motors and the Original Equipment Manufacturer of the Chevrolet City Express Compact Cargo vehicles. They also govern dealers, body builders, and all others who manufacture and market new motor vehicles and equipment. Part 568 of the Title 49 Code of Federal Regulations (CFR) describes requirements for intermediate manufacturers, final-stage manufacturers, and manufacturers who assume legal responsibility for a vehicle. This Body Builder's Guide (Guide) partially fulfills both General Motors and the OEM's obligations as the original equipment manufacturer. Additionally, this guide identifies regulatory requirements to assist intermediate and final stage manufacturers to determine their obligations to conform to these standards. Compliance labels affixed to Chevrolet City Express Compact Cargo vehicles provide the status of initial compliance at the date of manufacture by the Original Equipment Manufacturer (OEM). Subsequent modifications made to this vehicle may affect the final certification of the engine, vehicle or equipment. Any and all body builders, conversion companies, or dealers have the responsibility to certify the altered vehicle and equipment complies or continues to comply with all applicable motor vehicle safety standards and emissions regulations. The vehicle modifier is responsible for making sure the modifications or installed equipment does not affect the safety of the vehicle, which may result in a collision, serious personal injury or death. General Motors and/or the OEM does not assume the responsibility as the final stage manufacturer for modified or altered vehicles. General Motors and/or the OEM is not responsible for the final certification, product liability claims, or warranty claims, resulting from any component, assembly, or system being altered by the body builder, Conversion Company, dealer or vehicle purchaser. General Motors and/or the OEM is not responsible for modifications which cause the vehicle to become noncompliant with any of the motor vehicle safety standards, emissions regulations, or modifications that cause the vehicle to be or become defective or unsafe.

SAFETY INFORMATION

SUPPLEMENTAL RESTRAINT SYSTEM (SRS) PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) “Airbag” and “Belt Pre-Tensioner”

WARNING:

To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized General Motors dealer.

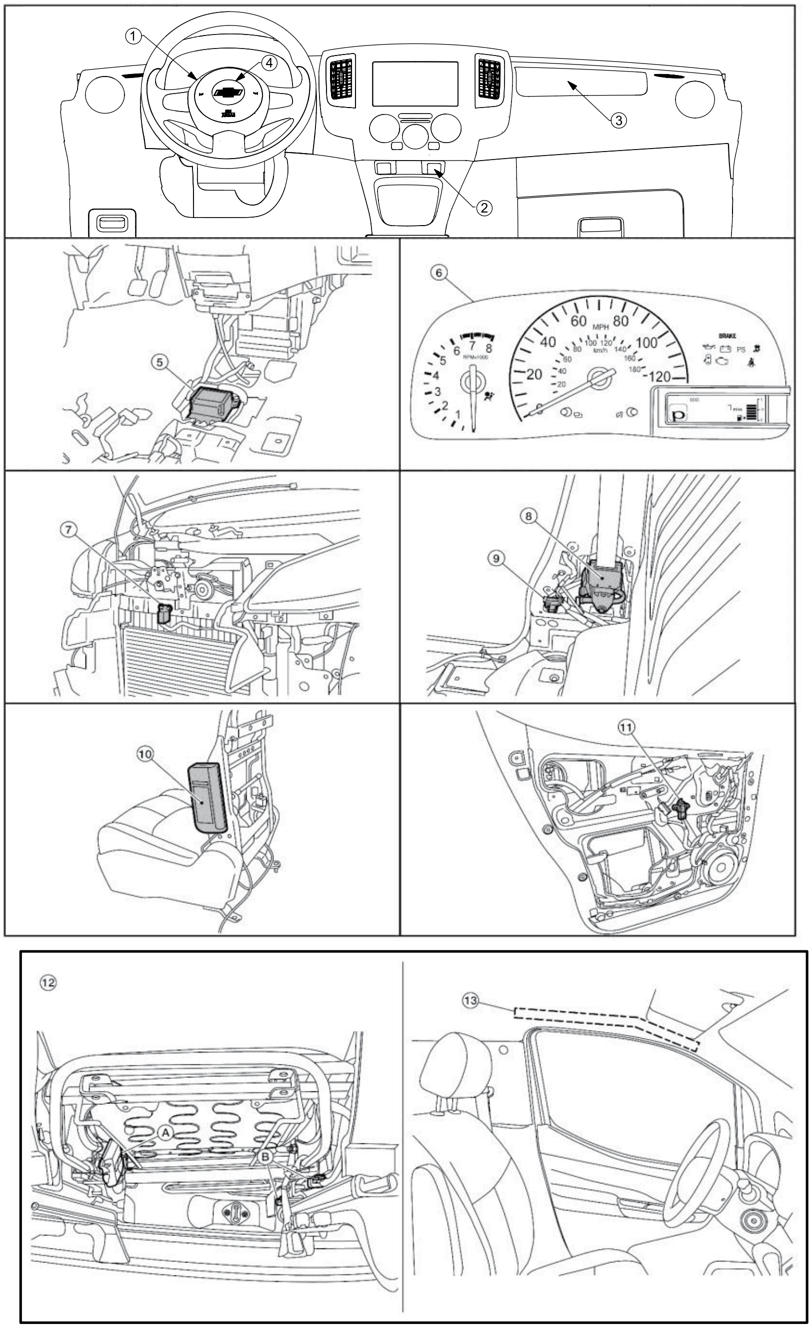
Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. • Do not use electrical test equipment on any circuit related to the SRS. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors. Precautions When Using power tools (air or electric) and hammers

WARNING:

When working near the Air bag Diagnosis Sensor Unit or other Air bag System sensors with the ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.

When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

SUPPLEMENTAL RESTRAINT SYSTEM (SRS) COMPONENT LOCATIONS



1. Driver air bag module
2. Passenger air bag OFF indicator
3. Front passenger air bag module
4. Spiral cable
5. Air bag diagnosis sensor unit (view with center console removed)
6. Instrument Cluster (SRS warning light)
7. Crash zone sensor (view with front grille removed)
8. Front LH seat belt pre-tensioner (RH similar) (view with lower center pillar cover removed)
9. Front side air bag satellite sensor LH (RH similar) 10. Front LH side air bag module (RH similar)
11. Front door satellite sensor LH (view with front door Finisher LH removed) (RH similar)
12. A. Occupant classification control unit B. Occupant classification system sensor
13. LH side front curtain air bag module (RH similar)

OCCUPANT CLASSIFICATION SYSTEM

WARNING:

After removal and installation of the front passenger seat, a zero point reset function must be performed by an authorized service center using a special tool. If zero point reset is not performed, the occupant classification system may not operate normally which may increase the risk of serious injury or death in a collision.

WARNING:

Do not disturb or modify the front passenger seat wiring. Failure to follow this instruction may cause incorrect operation of the occupant classification system and front passenger air bag or system failure and may increase the risk of serious injury or death in a collision.

The front passenger seat is equipped with seat weight sensors as part of the supplemental restraints occupant classification system. The occupant classification sensors (weight sensors) are on the seat cushion frame under the front passenger seat and are designed to detect an occupant and objects on the seat. The front passenger air bag status lamp is illuminated when the system is disabled. For occupant classification system and front passenger air bag operation, refer to the Owner's Manual. For repair of the front passenger seat, occupant classification system, air bags or if an air bag warning lamp is illuminated, refer to a General Motors dealer.

FRONT AIR BAG DEPLOYMENT ZONES

FRONT AIR BAG MODULE LOCATIONS

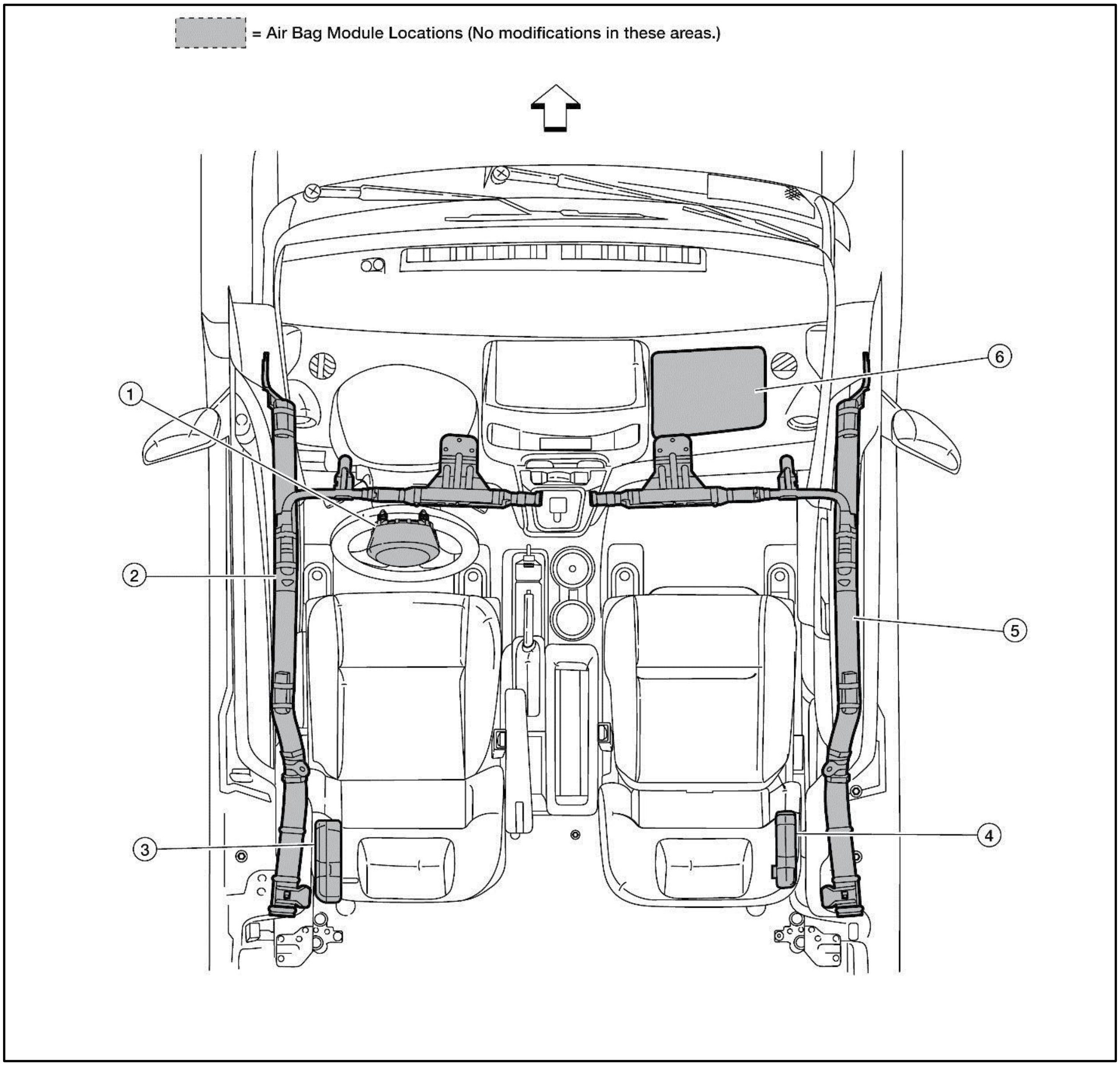
WARNING:

Modifications must not interfere with air bag modules or deployment zones. Damage to air bag modules and objects placed within air bag deployment zones may cause serious personal injury or death.

NOTE:

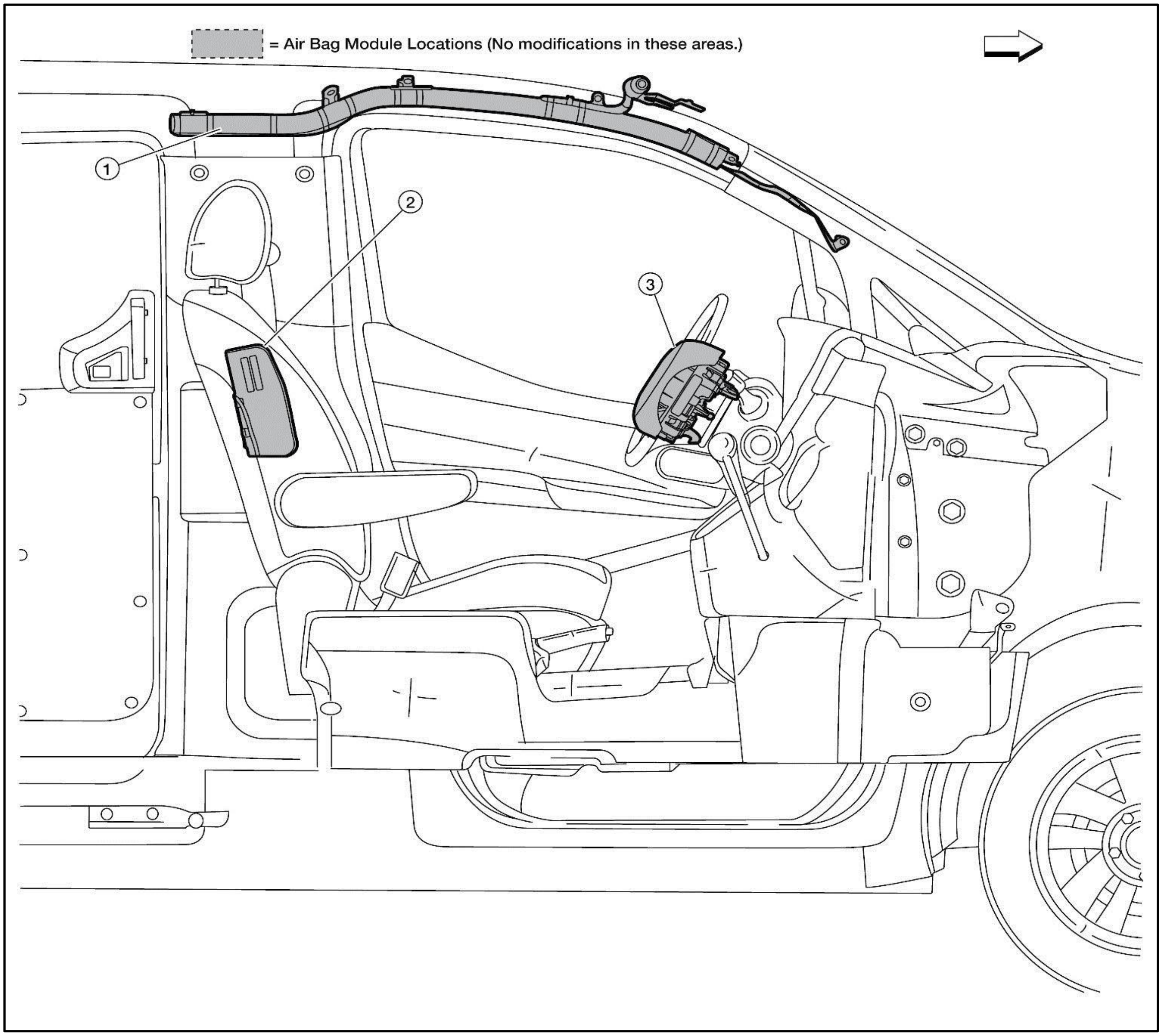
Do not add accessory items that, when installed, will interfere with the installed position of the air bag or the zones of the deploying air bags.

Front Air Bag Modules — Overhead View


▨ = Air Bag Module Locations (No modifications in these areas.)
①
②
③
④
⑤
⑥

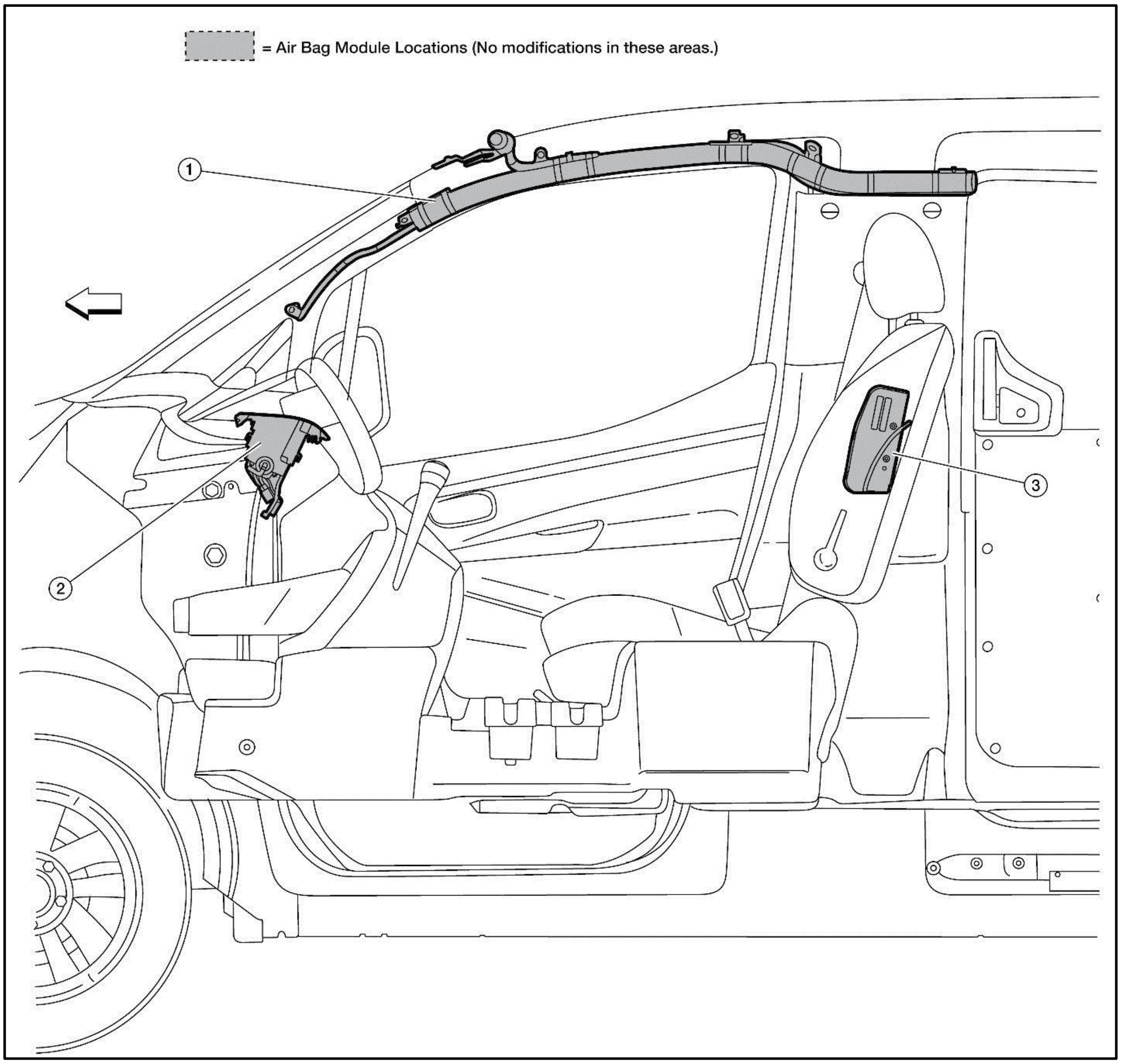
1. Driver air bag module
2. Side curtain air bag module, driver
3. Side air bag module, driver
4. Side air bag module, passenger
5. Side curtain air bag module, passenger
6. Front passenger air bag module

Front Air Bag Modules — Driver Side


▨ = Air Bag Module Locations (No modifications in these areas.)
1
2
3

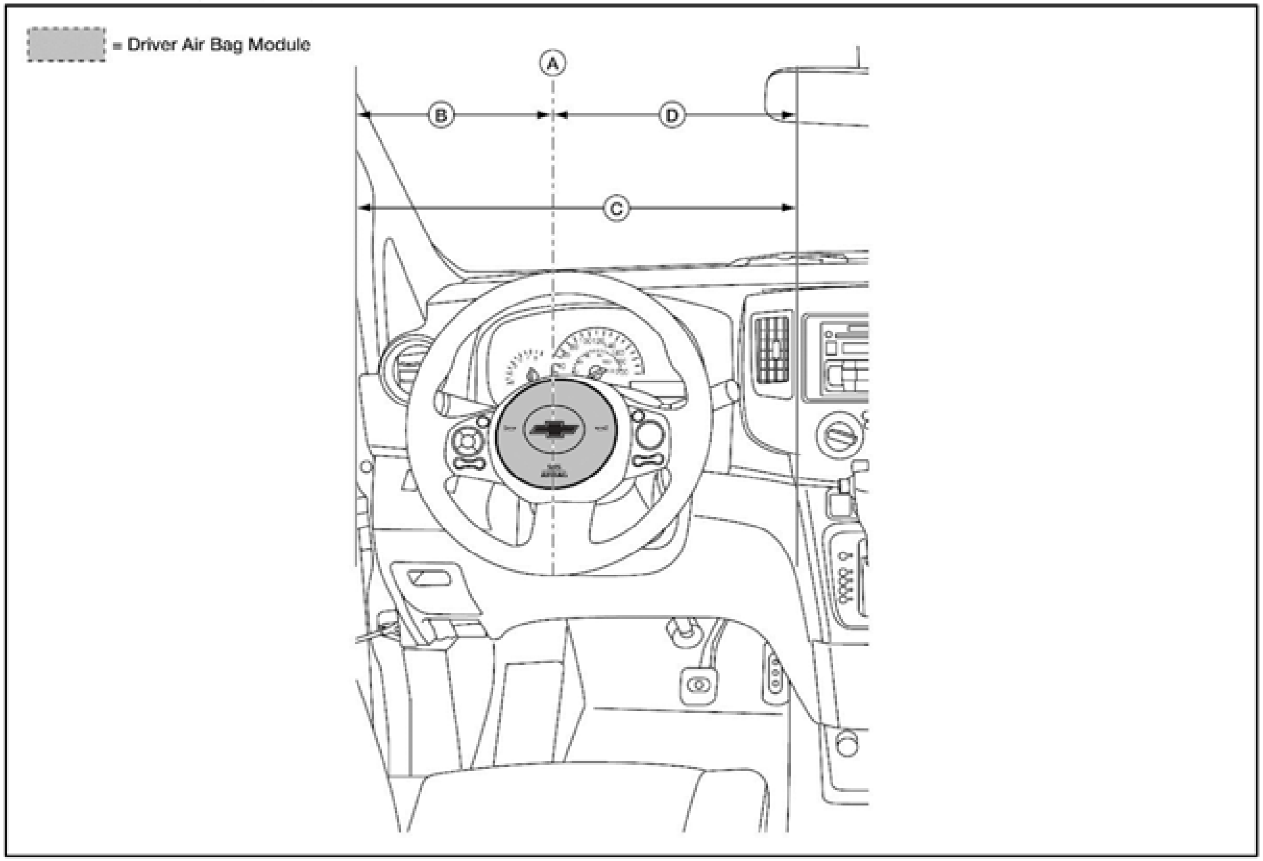
1. Side curtain air bag module (located behind LH side of headlining and across windshield header)
2. Side air bag module (located at outboard side of driver seatback)
3. Driver air bag module (located in steering wheel)

Front Air Bag Modules — Passenger Side


▨ = Air Bag Module Locations (No modifications in these areas.)
①
②
③

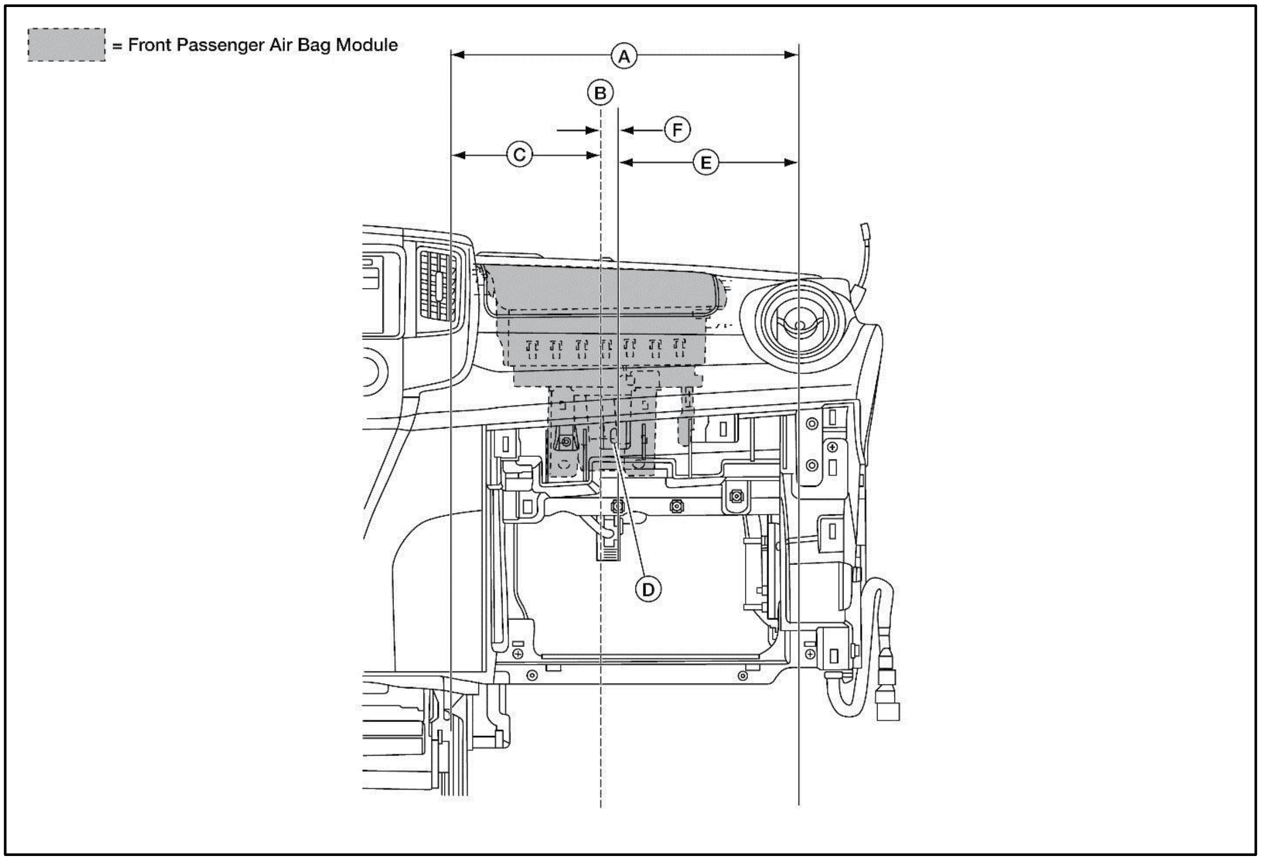
1. Side curtain air bag module (located behind RH side of headlining and across windshield header)
2. Front passenger air bag module (located in RH side of instrument panel)
3. Side air bag module (located at outboard side of passenger seatback)

Driver Air Bag Deployment Width


▨ = Driver Air Bag Module
A
B
D
C

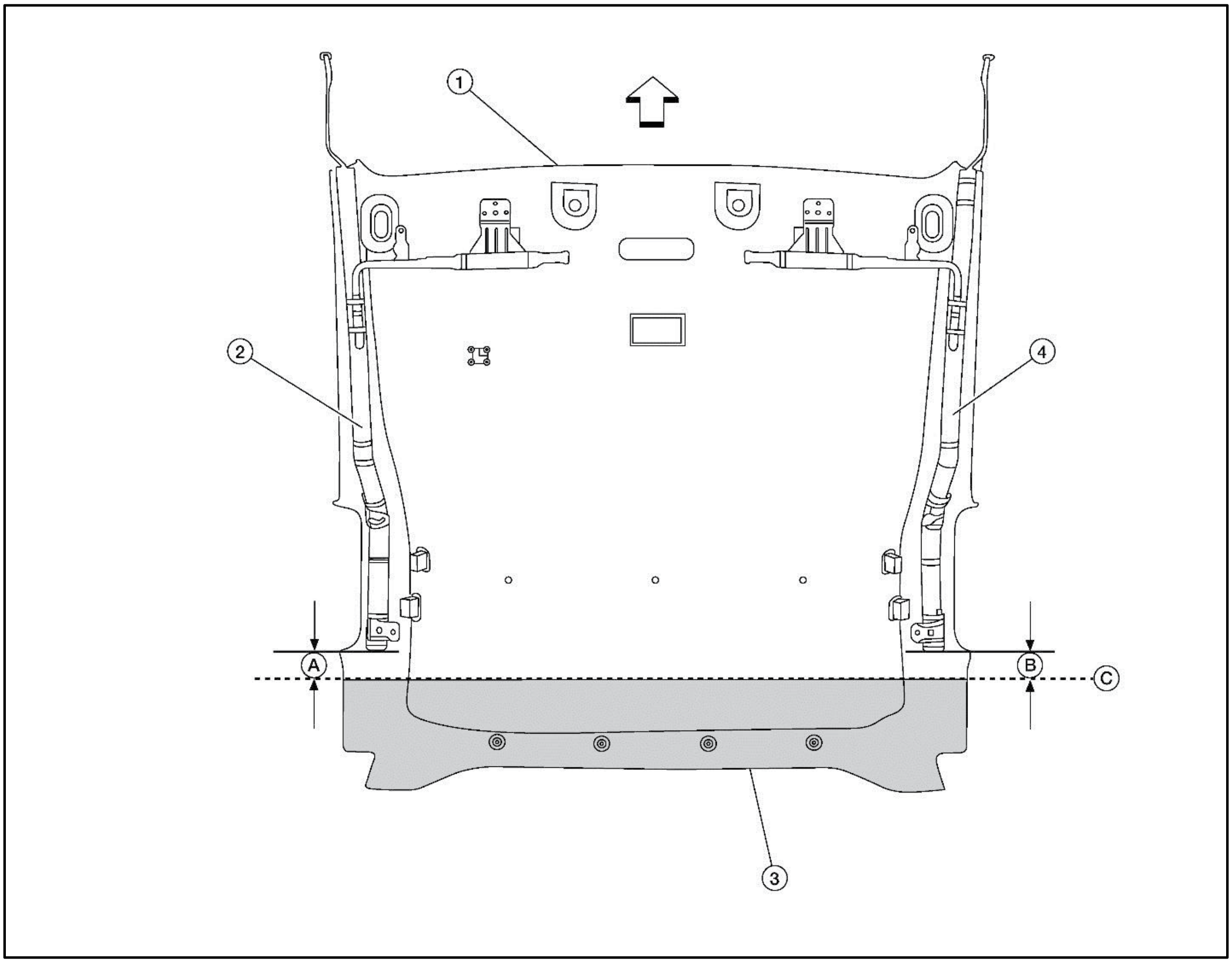
A. Center of the driver air bag module housing
B. 267.5 mm (10.53 in)
C. Maximum lateral projection of the deployed driver air bag 535 mm (21.06 in)
D. 267.5 mm (10.53 in)

Front Passenger Air Bag Deployment Width


▨ = Front Passenger Air Bag Module
A
B
F
C
E
D

A. Maximum lateral projection of the deployed front passenger air bag 475 mm (18.7 in)
B. Center of front passenger air bag module housing
C. 237.5 mm (9.35 in)
D. Reference point: glove box striker inboard fastener
E. 199 mm (7.83 in)
F. 38.5 mm (1.52 in)

Headlining Cut — Front Side Curtain Air Bags Clearance for Bulkhead Installation

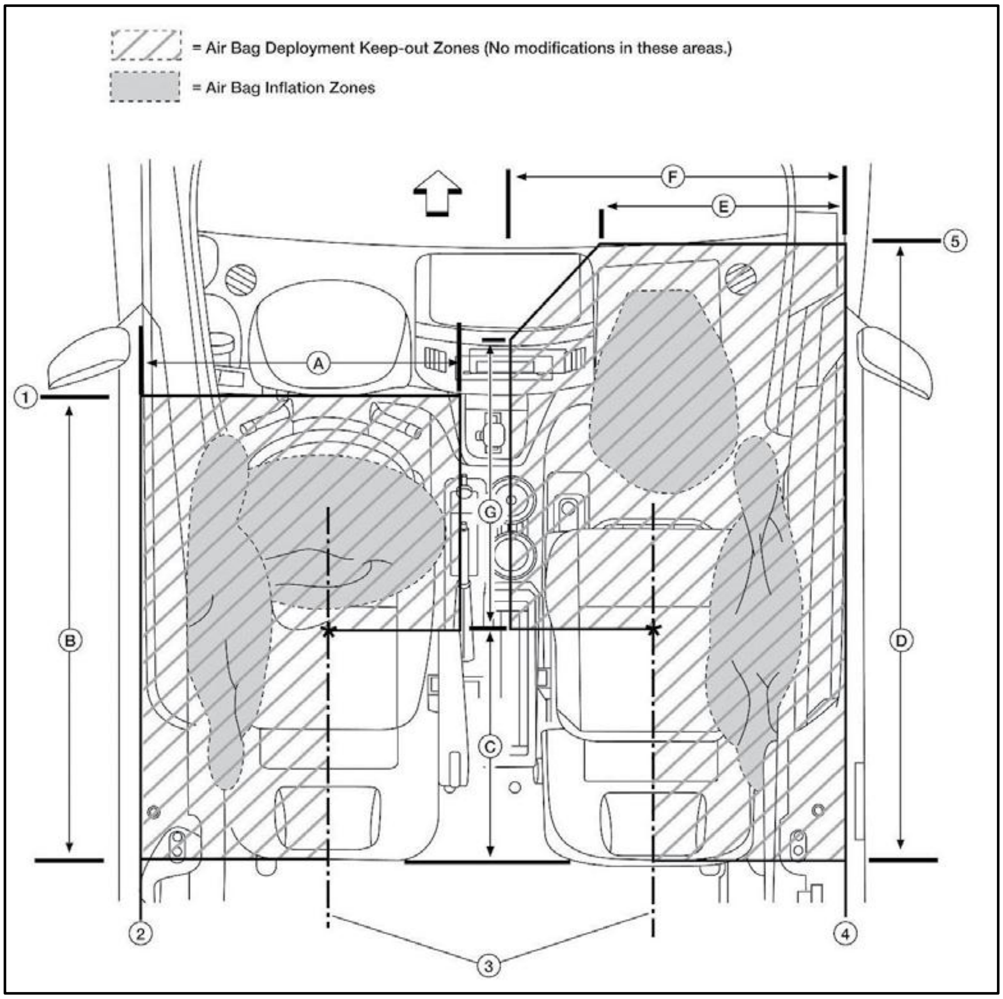


1. Headlining
2. Driver side curtain air bag module
3. Portion of headlining to be cut off and discarded
4. Passenger side curtain air bag module

A. 50 mm (1.97 in)
B. 50 mm (1.97 in)
C. Headlining cut line (50 mm [1.97 in] behind rear edge of side curtain air bag module’s rolled material)

AIR BAG DEPLOYMENT KEEP-OUT ZONES

Front Air Bag Keep-Out Zones — Overhead View

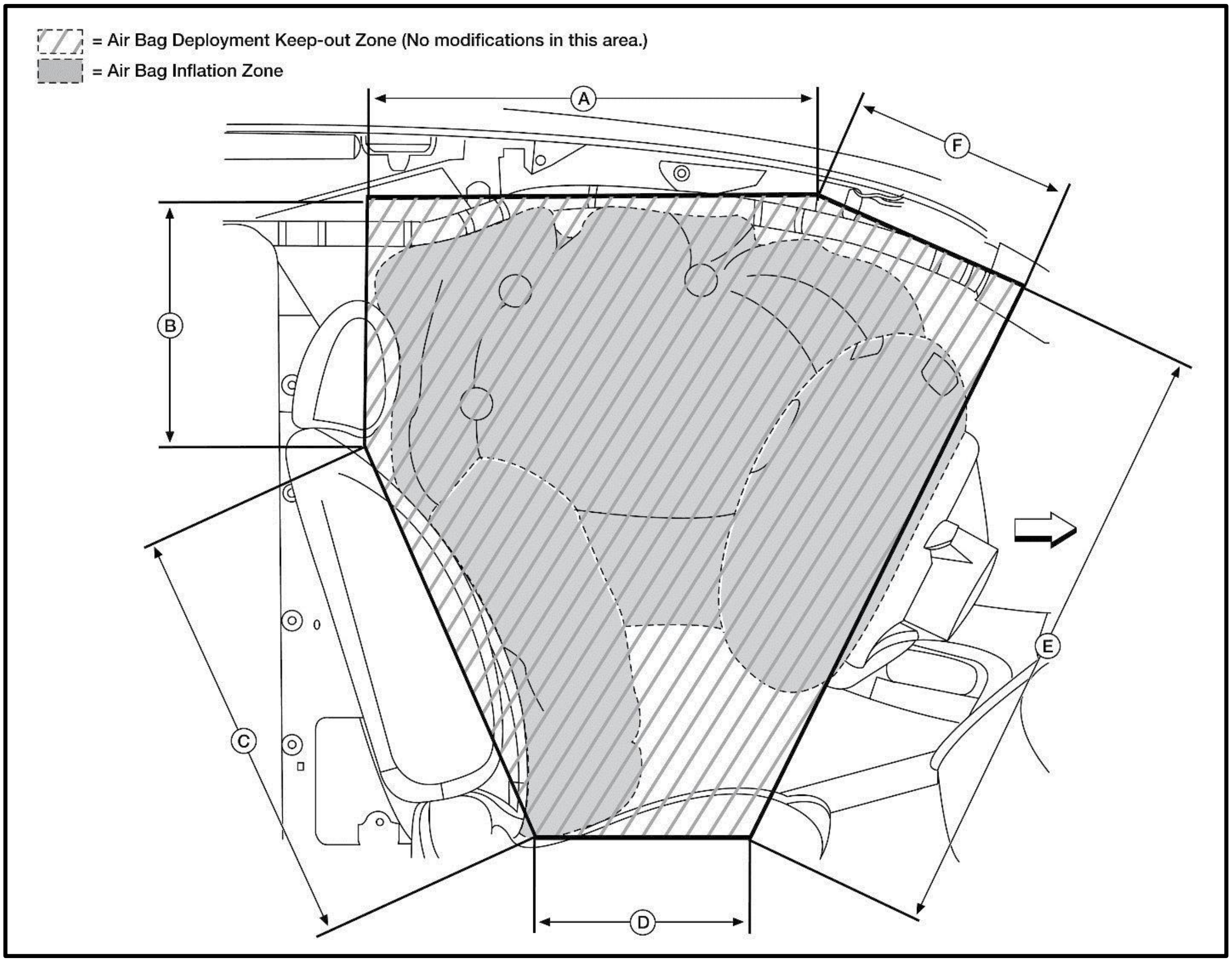


= Air Bag Deployment Keep-out Zones (No modifications in these areas.)
= Air Bag Inflation Zones
F
E
5
A
1
G
B
D
C
2
4
3

*Center of seat

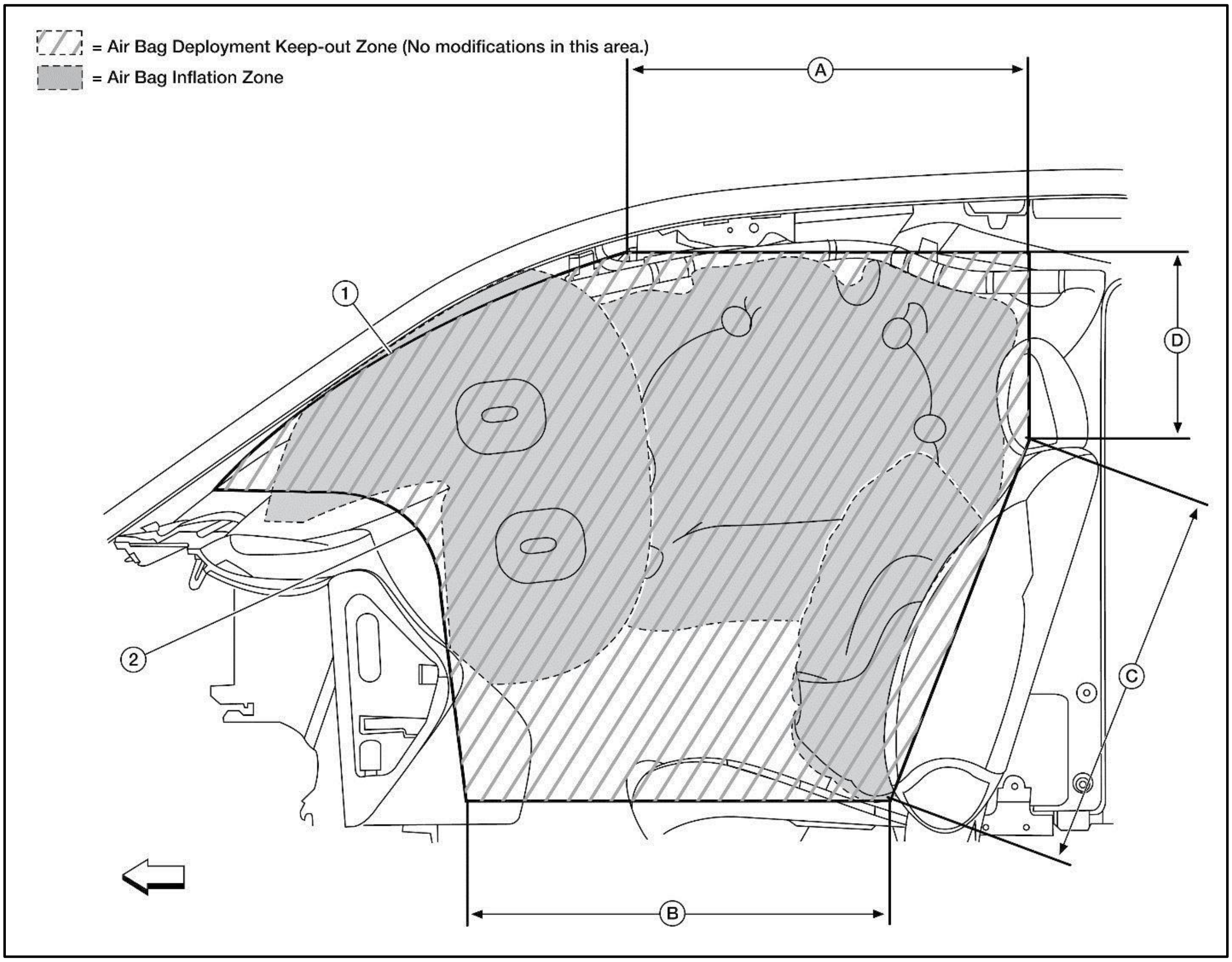
1. Reference point: instrument panel edge
2. Reference point: door glass trim edge
3. Reference point: seat center lines
4. Reference point: door glass trim edge

Front Air Bag Keep-Out Zone — Driver Side View


= Air Bag Deployment Keep-out Zone (No modifications in this area.)
= Air Bag Inflation Zone
A
B
C
D
E
F

A. 635 mm (25 in)
B. 510 mm (20.08 in)
C. 685 mm (26.97 in)
D. 405 mm (15.94 in)
E. 915 mm (36.02 in)
F. 355 mm (13.98 in)

Front Air Bag Keep-Out Zone — Passenger Side View

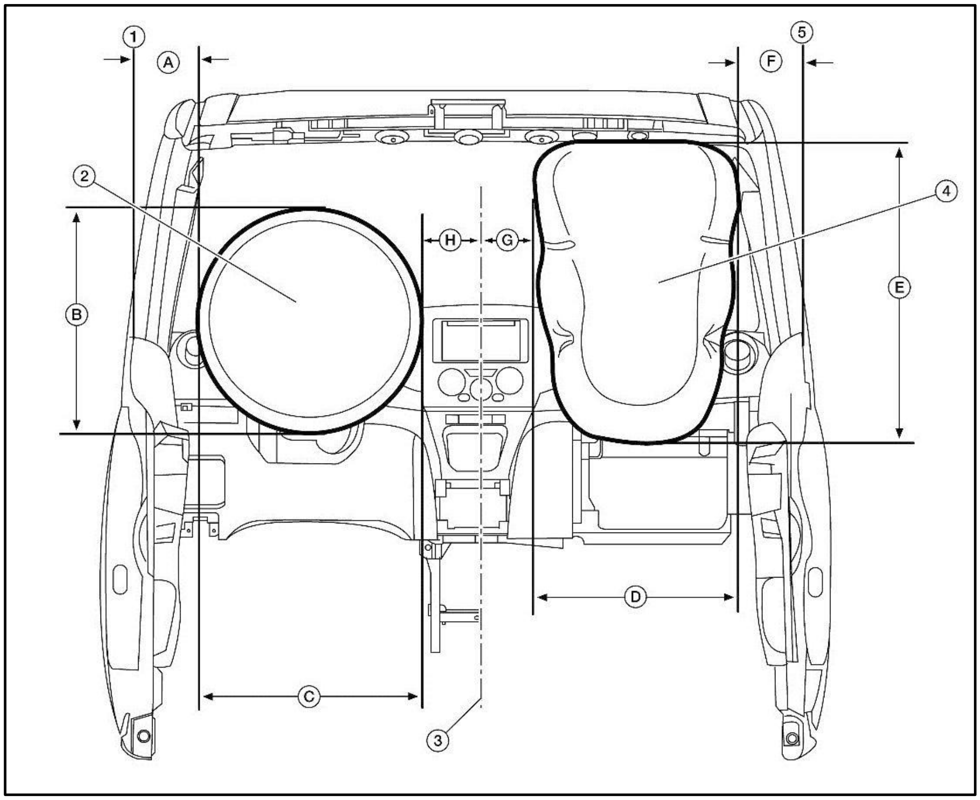

= Air Bag Deployment Keep-out Zone (No modifications in this area.)
= Air Bag Inflation Zone
A
D
1
C
2
B

1. Reference point: zone follows windshield surface
2. Reference point: zone follows instrument panel surface contour

A. 635 mm (25.00 in)
B. 405 mm (15.94 in)
C. 685 mm (26.97 in)
D. 510 mm (20.08 in)

INFLATED AIR BAG ZONE DIMENSIONS

Driver and Passenger Air Bag Inflation Zones — Forward View

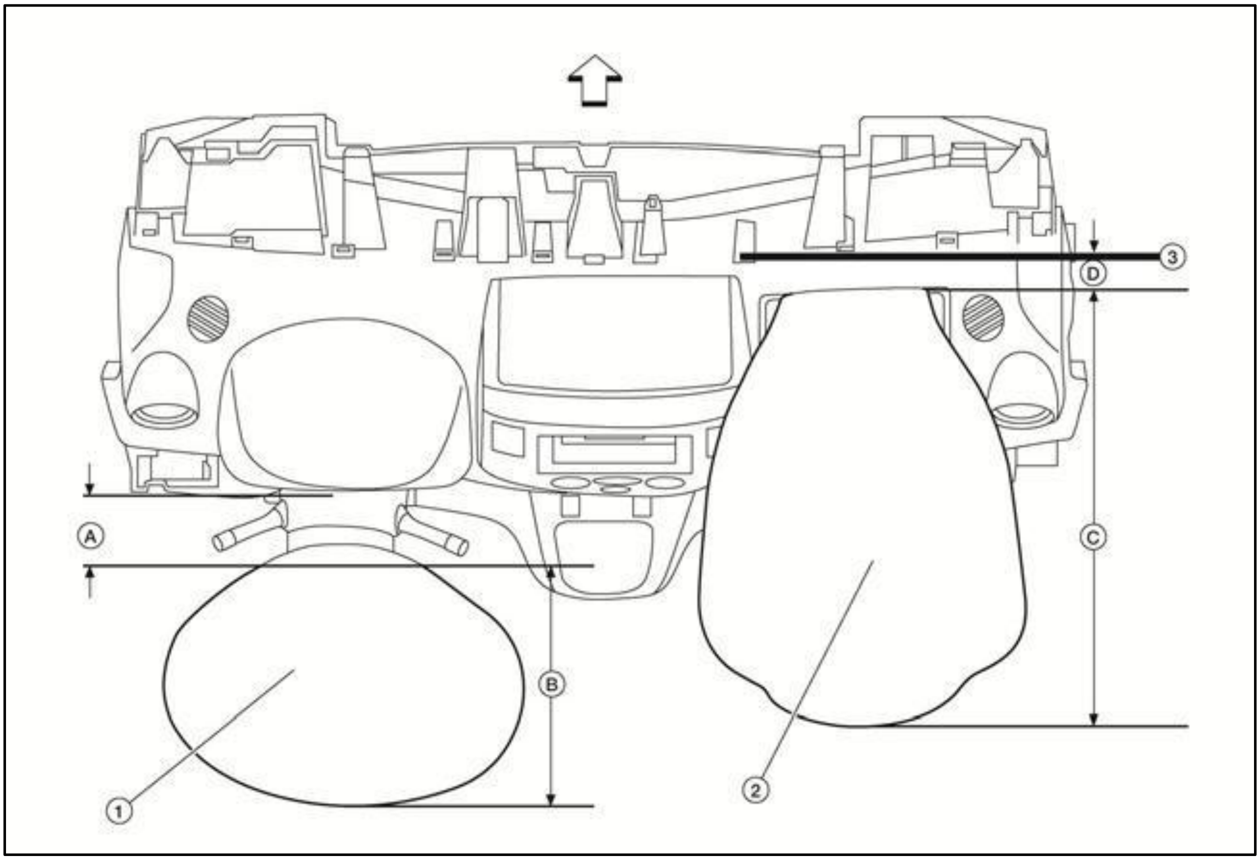


Reference point:

1. Door glass trim edge
2. Maximum inflated driver air bag
3. Reference point: vehicle center line
4. Maximum inflated front passenger air bag
5. Reference point: door glass trim edge

A. 150 mm (5.91 in) between door glass trim edge and air bag.
B. 535 mm (21.06 in)
C. 535 mm (21.06 in)
D. 475 mm (18.70 in)
E. 690 mm (27.17 in)
F. 150 mm (5.91 in) between door glass trim edge and air bag.
G. 120 mm (4.72 in)
H. 125 mm (4.92 in)

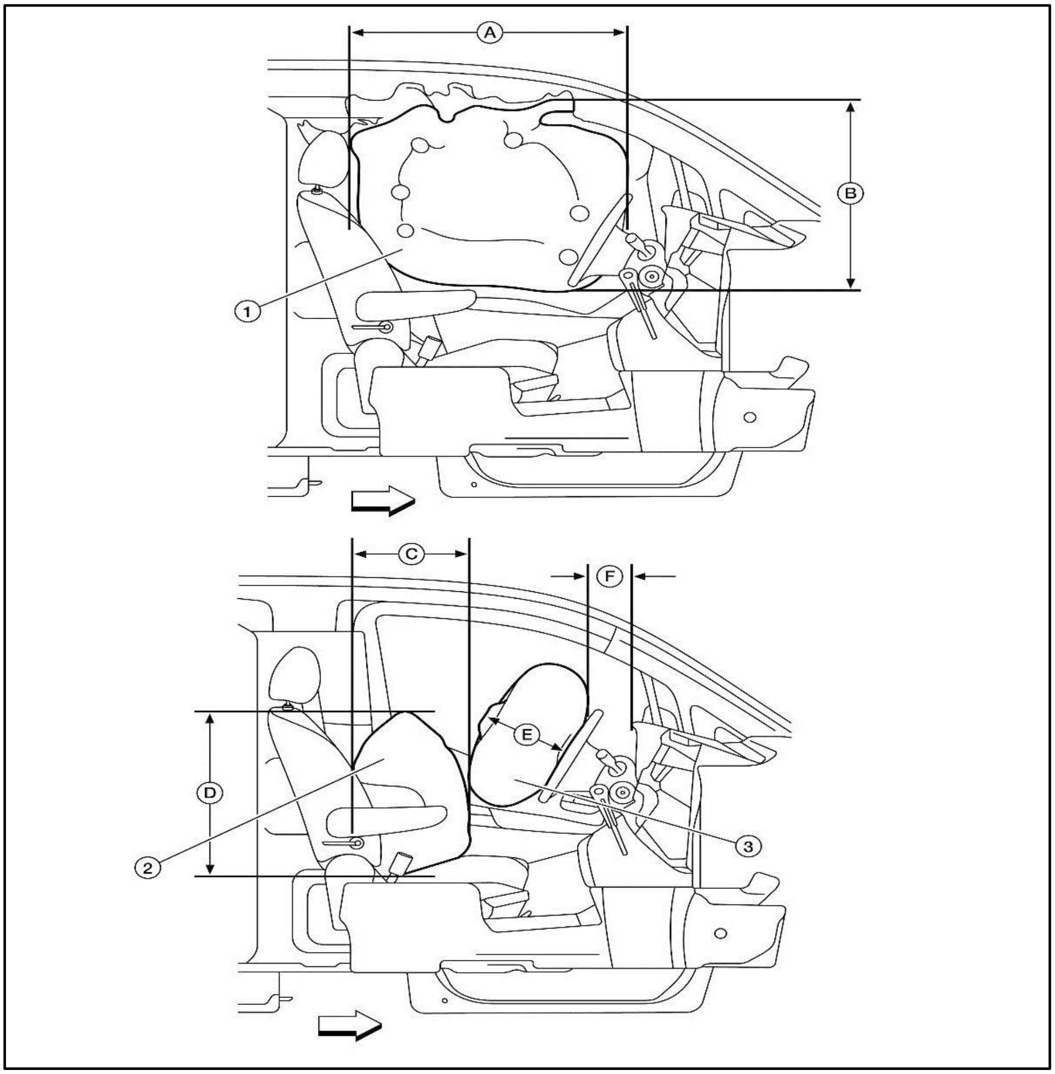
Front Air Bag Inflation Zones — Overhead View



1. Maximum inflated driver air bag
2. Maximum inflated front passenger air bag
3. Reference point: instrument panel seam

A. 110 mm (4.33 in) between instrument panel and air bag.
B. 340 mm (13.39 in)
C. 645 mm (25.39 in)
D. 40 mm (1.57 in)

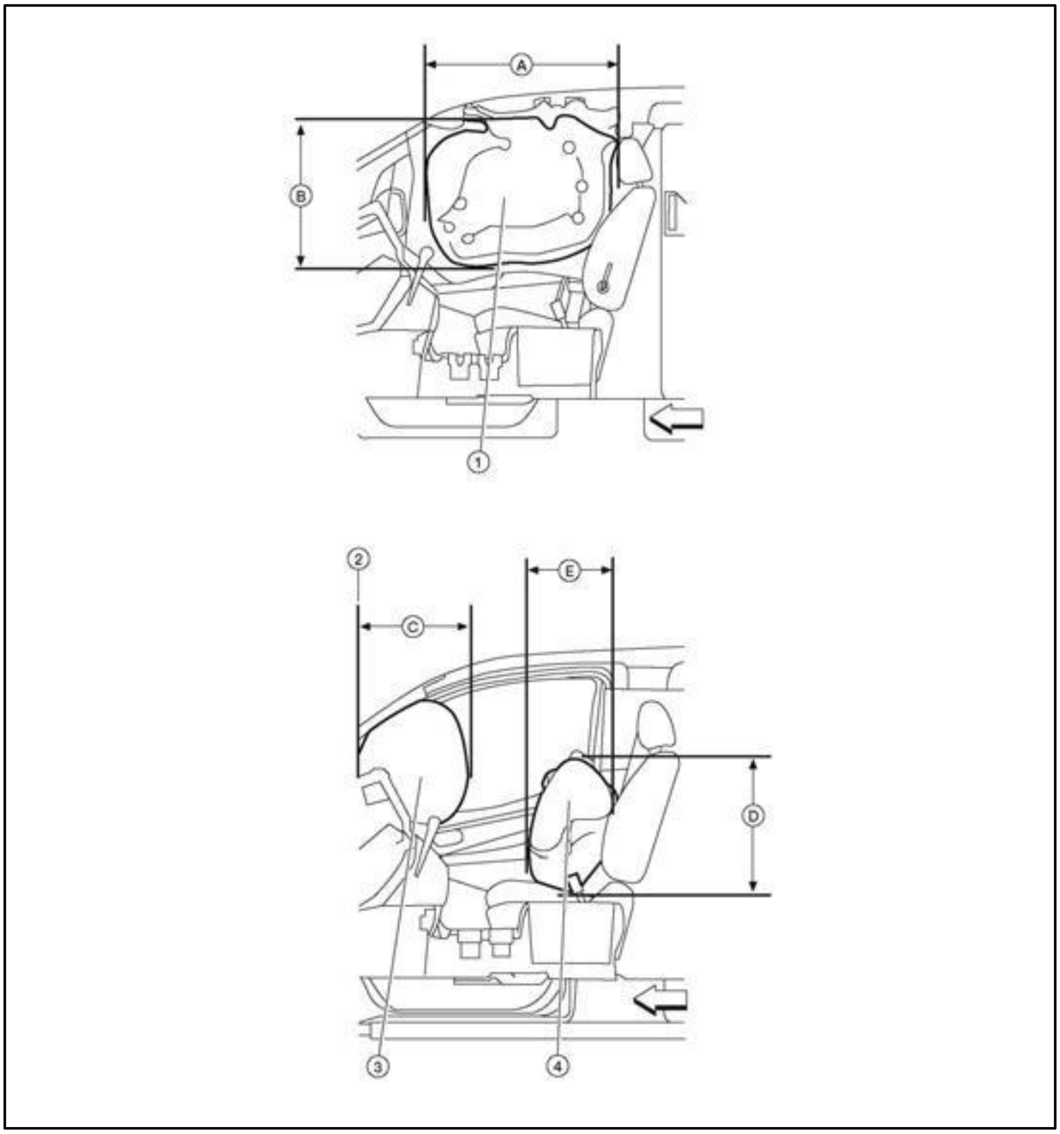
Front Air Bag Inflation Zones — Driver Side View



1. Maximum inflated side curtain air bag
2. Maximum inflated side air bag
3. Maximum inflated driver air bag.

A. 760 mm (29.92 in)
B. 750 mm (29.53 in)
C. 350 mm (13.78 in)
D. 550 mm (21.65 in)
E. 200 mm (7.87 in)
F. 110 mm (4.33 in) between instrument panel and air bag

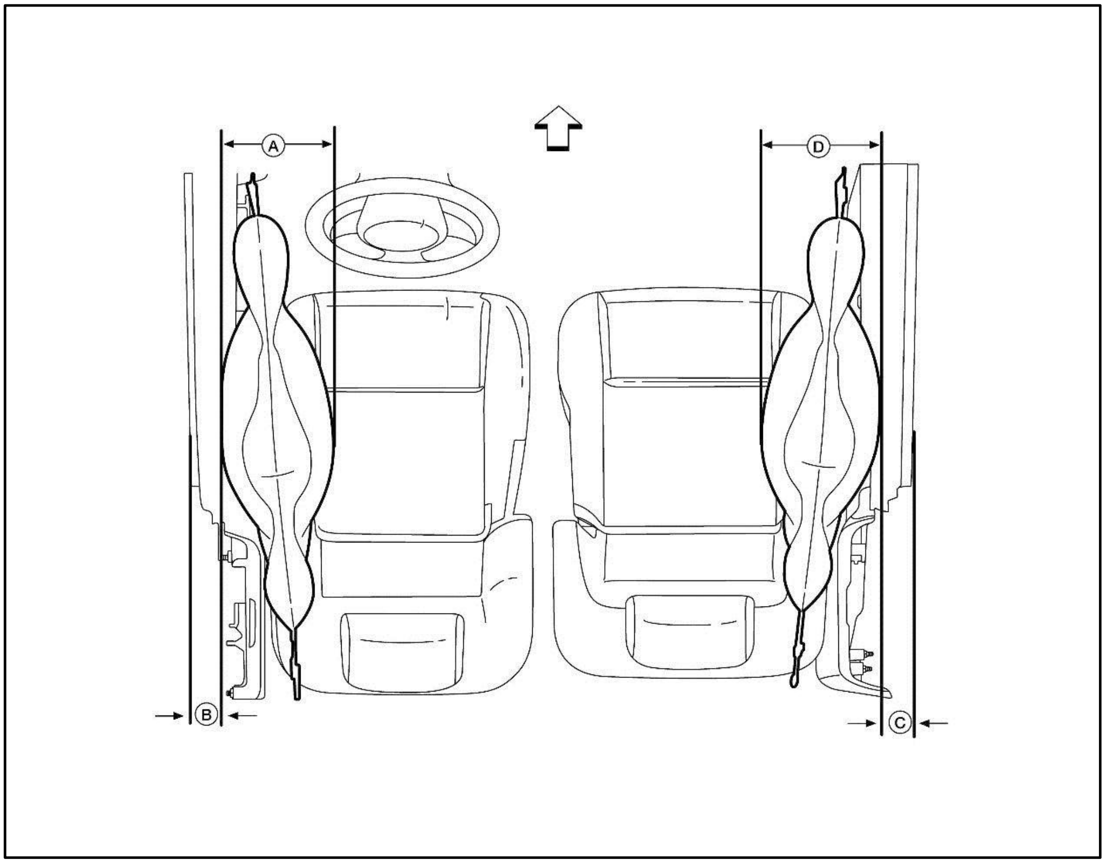
Front Air Bag Inflation Zones — Passenger Side View



1. Maximum inflated side curtain air bag
2. Front edge of front passenger air bag module
3. Maximum inflated front passenger air bag
4. Maximum inflated side air bag

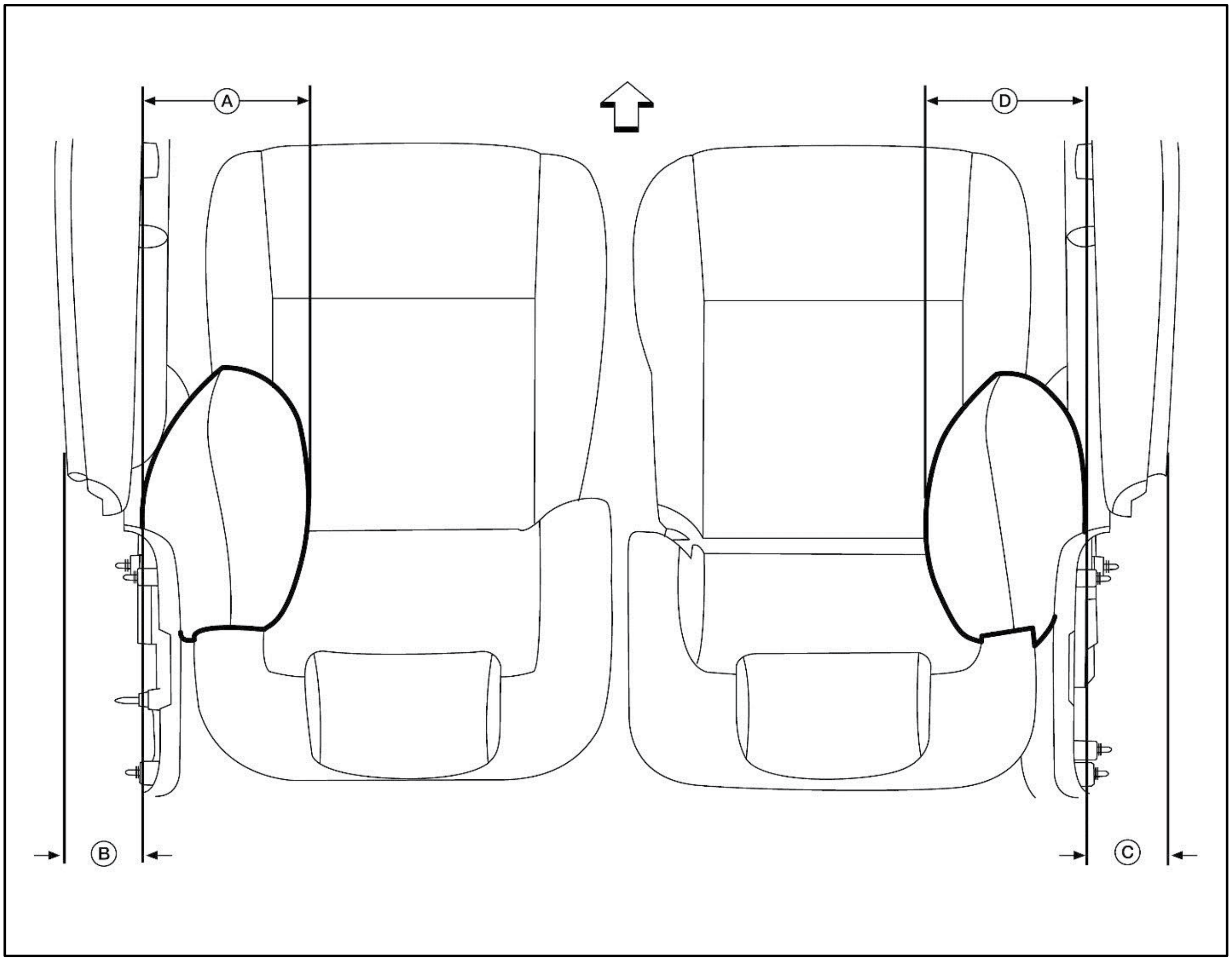
A. 760 mm (29.92 in)
B. 750 mm (29.53 in)
C. 645 mm (25.39 in)
D. 550 mm (21.65 in)
E. 350 mm (13.78 in)

Side Curtain Air Bag Inflation Zones — Overhead View



A. 210 mm (8.27 in)
B. 60 mm (2.36 in) between door glass trim edge and air bag.
C. 60 mm (2.36 in) between door glass trim edge and air bag.
D. 210 mm (8.27 in)

Side Air Bag Inflation Zones — Overhead View



A. 200 mm (7.87 in)
B. 115 mm (4.53 in) between door glass trim edge and air bag.
C. 115 mm (4.53 in) between door glass trim edge and air bag.
D. 200 mm (7.87 in)

ALTERED VEHICLES

Safety / Emissions

Certification Labels for Altered Vehicles

USA:

A person or company who alters a previously certified vehicle before the first purchase by the final customer in such a manner that its stated weight ratings are revised, is required by Federal Regulation (49 CFR Part 567.7) to affix an Altered Vehicle Certification Label in addition to the FMVSS and CMVSS Certification Label. The label must be affixed to the vehicle in the manner and form described in 49 CFR Part 567.4:

- The label shall, unless riveted, be permanently affixed in such a manner that it cannot be removed without destroying or defacing it.
- The label shall be affixed to either the hinge pillar, B-pillar, or the door edge that meets the door-latch post next to the driver's seating position or, if none of these locations is practicable, to the left side of the instrument panel (other permissible locations are also specified in 49 CFR Part 567.4).
- The lettering on the label shall be of a color that contrasts with the background of the label.
- The label shall contain the required statements in the English language and lettered in block capitals and numerals not less than three thirty-seconds of an inch high.
- The lettering shall be permanent. If typed or written, a protective clear cover may be necessary to prevent information from being wiped off.
- Label must not cover or obscure the FMVSS or CMVSS Certification Label.

Canada:

“Alterers” of motor vehicles are required to affix a permanent label on vehicles that they manufacture bearing a statement of compliance as provided by Section 9 of the Canadian Motor Vehicle Safety Regulations. The vehicle alterer should affix a corporate label containing information shown on this page.

- Insert the name of the company that altered the vehicle.
- Insert the month and year during which the alteration of the vehicle was completed.
- Insert a drawing of the National Safety Mark which includes their unique manufacturer number.
- Insert revised GVWR or PNBV capacities in kilograms of the vehicle as altered, where they differ from those shown on the original certification label.
- Insert the GAWR/PNBEs of the vehicle as altered, where they differ from those shown on the original certification label.

Also, include the tire size, rim size and tire inflation pressure.

- Insert the vehicle type stated on the safety standard certification label provided by General Motors/OEM.

The type of vehicle, in both official languages, and the word 9TYPE9 along with one of the following abbreviations, namely:

- 9AT/PA9 to refer to an auto transporter,
- 9ATV/VTT9 to refer to an all-terrain vehicle,
- 9B/A9 to refer to a bus,
- 9BT/RA9 to refer to a bus trailer,
- 9CD/CCC9 to refer to a C-dolly,
- 9CMC/MCC9 to refer to a competition motorcycle,
- 9LDD/CRC9 to refer to a load divider dolly,
- 9MH/AC9 to refer to a motor home,
- 9MC9 to refer to a motorcycle,
- 9MPV/VTUM9 to refer to a multi-purpose passenger vehicle,
- 9RUM/MUR9 to refer to a restricted-use motorcycle,
- 9SB/AS9 to refer to a school bus,
- 9TRA/REM9 to refer to a trailer,
- 9TCD/CDC9 to refer to a trailer converter dolly,
- 9TRU/CAM9 to refer to a truck, and
- 9TT/CT9 to refer to a truck tractor.

The label must meet the following requirements as described in Section 9:

- Shall be permanently attached.
- Shall be affixed adjacent to the original compliance label required by Section 6.
- The lettering of the label shall be clear, indelible, indented, or embossed, or of a color that contrasts with the background color of the label, and in block capitals and numerals not less than 2.0 mm (0.1 in) high.
- The label shall be permanently affixed to the same surface as that to which the FMVSS or CMVSS label is affixed.

BRAKE COMPLIANCE GUIDELINES

Brake Compliance Guidelines (FMVSS and CMVSS 105)

Any changes to the vehicle must still comply with FMVSS and CMVSS 105 allowing for the following provisions:

No alterations, modifications or replacements are made to the following systems:

- Parking Brake
- Anti-Lock Brakes
- Engine Vacuum
- Steering
- Wheels or Tires
- Brakes
- Indicator Lamps and Wiring
- Brake System Reservoir Labeling
- Suspension Ride Height or Spring Rate
- The vehicle is re-balanced by the addition of an equivalent weight if components are permanently removed. • The applicable GAWRs and GVWR weights are not exceeded.
- The applicable center of gravity limitations are met.
- The vertical distance from the ground to the completed vehicle center of gravity should not exceed 1,219.2 Mm (48 in) at the Gross Vehicle Weight Rating (GVWR).

FMVSS AND CMVSS REGULATION LIST

Standards

For FMVSS standards, refer to the following website:

http://www.nhtsa.gov/staticfiles/rulemaking/pdf/FMVSS-QuickRefGuide-HS811439.pdf

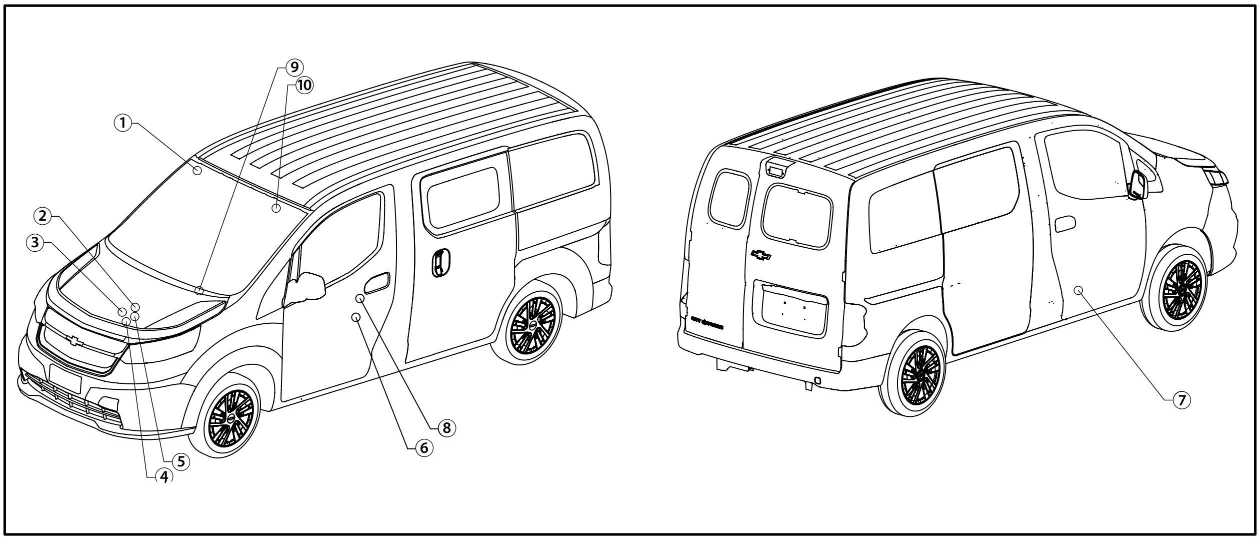
For CMVSS standards, refer to the following website:

http://www.tc.gc.ca/eng/acts-regulations/regulations-crc-c1038.htm

MODEL INFORMATION

LABEL INFORMATION

Identification Number



1. SRS air bag warning label
2. Air conditioning specification label
3. Transmission fluid specification label

4. Brake fluid warning label
9. Vehicle identification number (VIN) plate

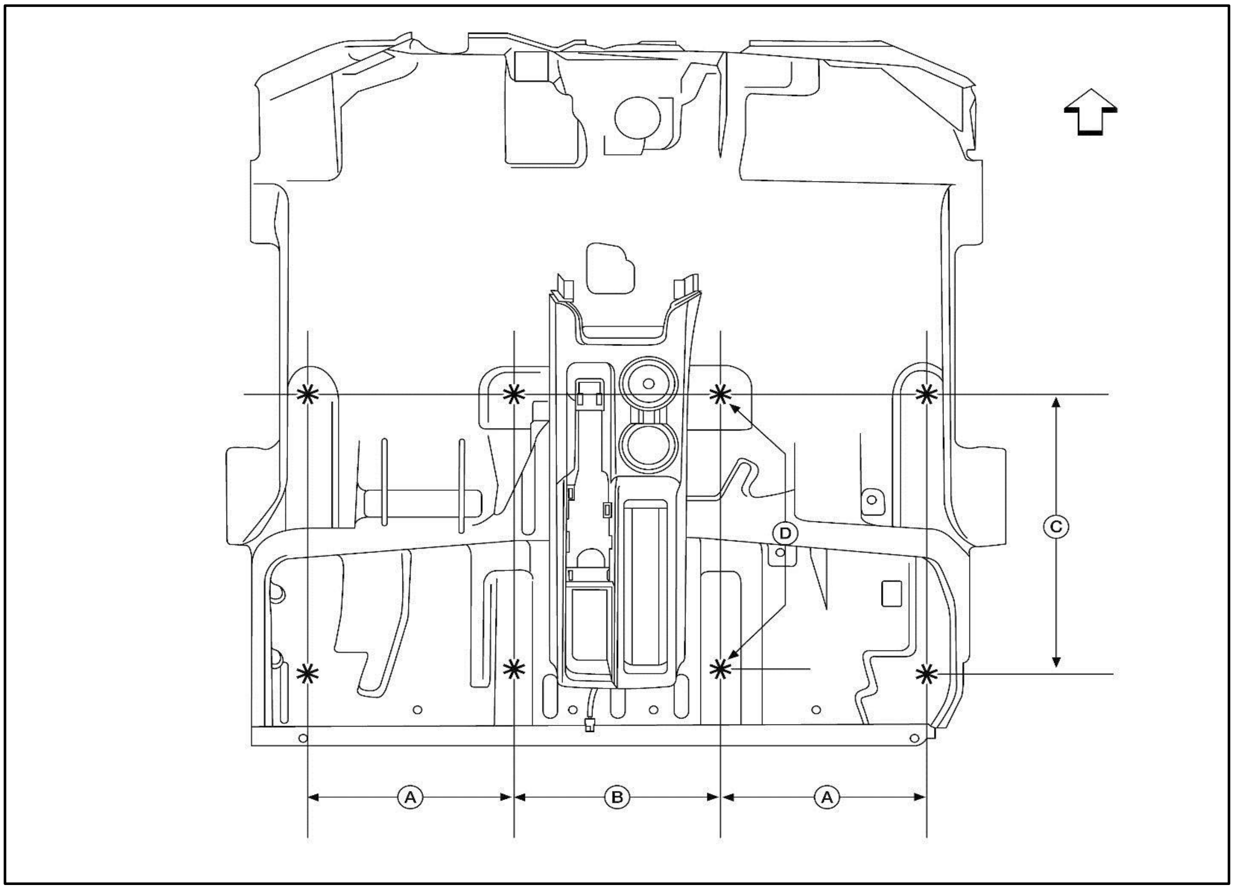
5. Emission control information label
6. FMVSS/CMVSS Certification Label
7. Vehicle identification number (Chassis number)
(located near right side of passenger seat)

8. Tire and loading information label
10. SRS air bag warning label

BODY DIMENSIONS

PASSENGER COMPARTMENT

Seat Mounting Holes



Front Seat Mounting Hole Dimensions
A. 380 mm (15.0 in) B. 375 mm (14.8 in)
C. 560 mm (22.0 in) D. 550 mm (21.7 in)

WARNING:

After removal and installation of the front passenger seat, a zero point reset function must be performed by a General Motors dealer using a special tool. If zero point reset is not performed, the occupant classification system may not operate normally which may increase the risk of serious injury or death in a collision.

WARNING:

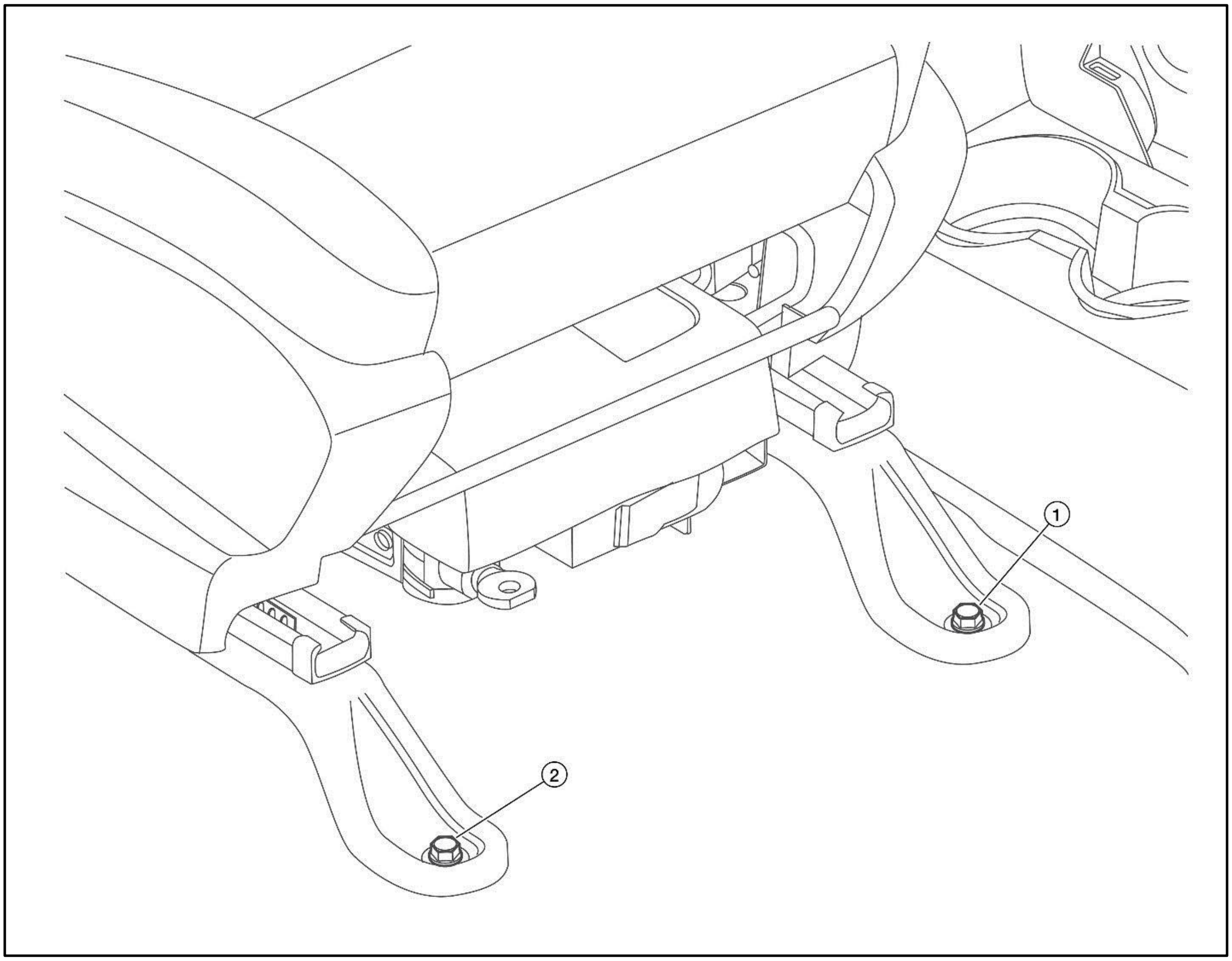
Do not disturb or modify the front passenger seat wiring. Failure to follow this instruction may cause incorrect operation of the occupant classification system and front passenger air bag or system failure and may increase the risk of serious injury or death in a collision.

NOTE:

For complete removal and installation procedure of the front seats, refer to the SE section in the service manual. Basic seat installation uses the following sequence:

1. Before removing or installing the front seats, turn ignition switch OFF, disconnect both battery terminals and wait at least 3 minutes.
2. Place the seat in the vehicle on the mounting stud with the locator pin correctly seated. Make sure there are no foreign objects under the seat, seat belts, pinched wires or carpeting between the seat mounting feet and floor.
3. Fully connect the seat electrical connectors and make sure the inboard and outboard seat tracks are positioned evenly and locked in place.
4. Install the front outboard seat bolt and hand tighten only.
5. Install the front inboard seat bolt and tighten to 40 Nm (30 ft-lb).
6. Tighten the front outboard seat bolt to 40 Nm (30 ft-lb).
7. Move the seat forward and install the rear inboard seat bolt. Make sure both seat tracks are locked in place and tighten to 40 Nm (30 ft-lb).
8. Install the rear outboard seat nut. Tighten to 40 Nm (30 ft-lb) and install the cap.
9. Connect the battery.
10. For front passenger seat, the zero point reset function must be performed by a General Motors dealer.
11. Install all the seat fastener caps.

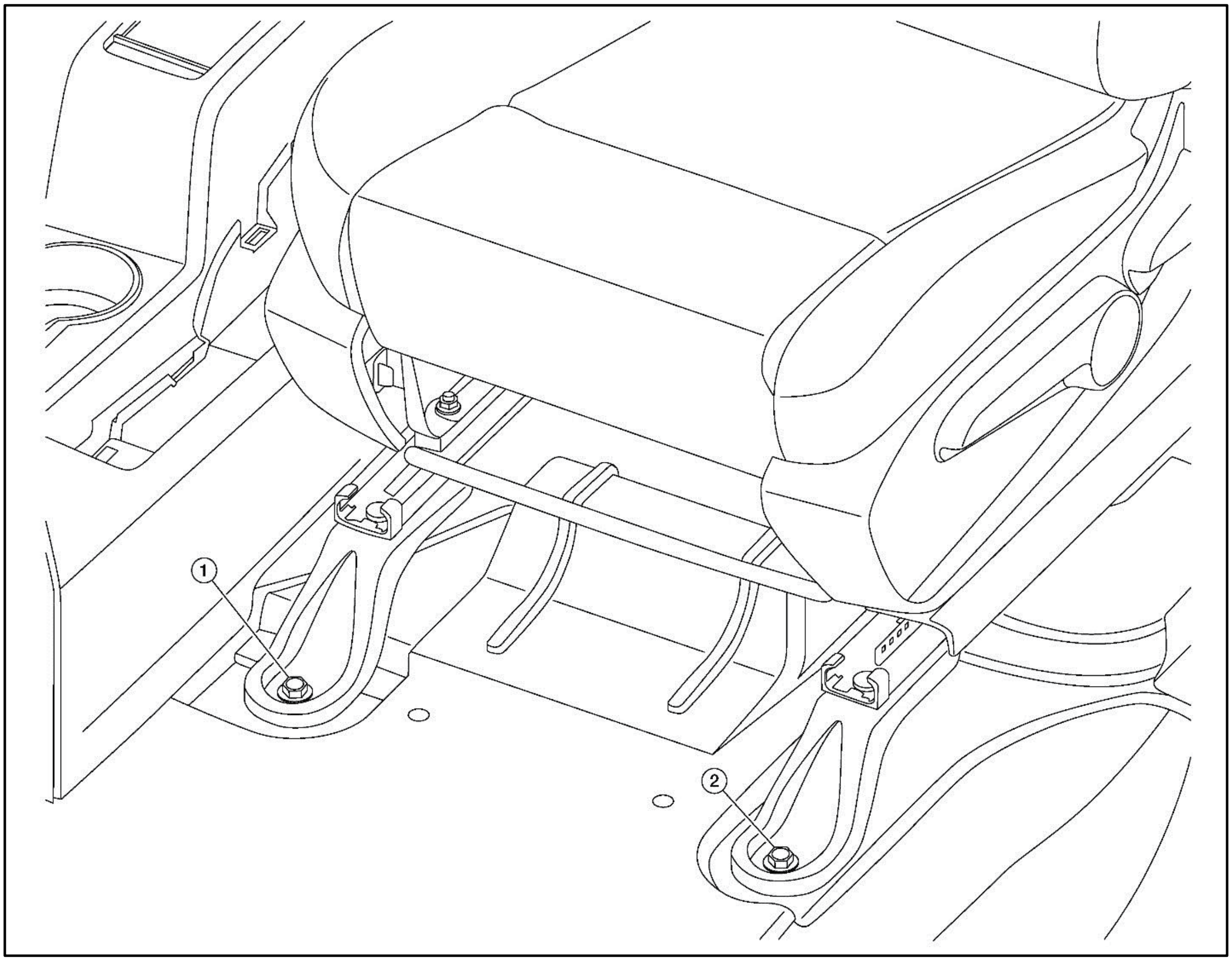
RH Front Seat Front Mounting Hole Location



1. Inboard center of hole
X: 874.1 mm (34.4 in)
Y: 188.6 mm (7.4 in)
Z: 265.6 mm (10.5 in)

2. Outboard center of hole
X: 874.1 mm (34.4 in)
Y: 568 mm (22.4 in)
Z: 265.6 mm (10.5 in)

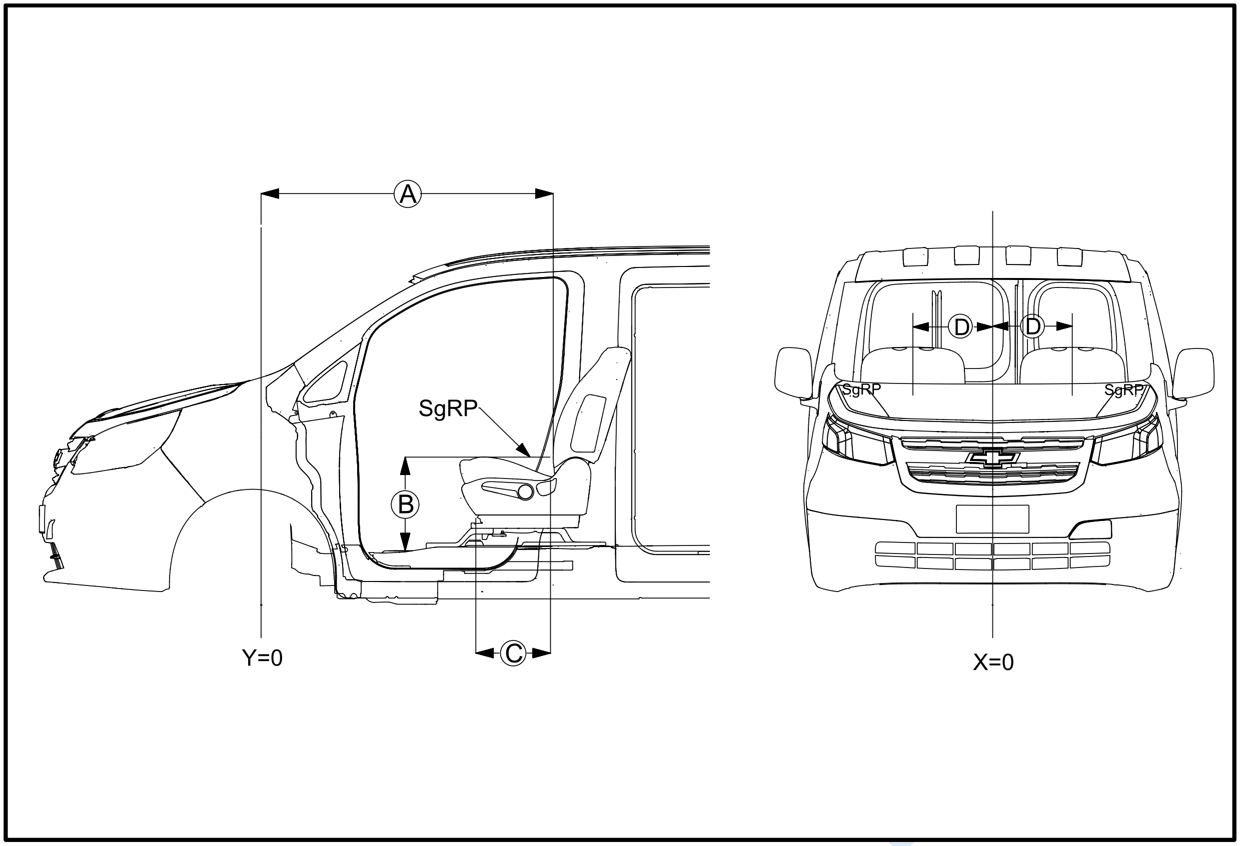
LH Front Seat Front Mounting Hole Location



1. Inboard center of hole	**2. Outboard center of hole**
X: 874.1 mm (34.4 in)	X: 874.1 mm (34.4 in)
Y: -188.6 mm (-7.4 in)	Y: -568 mm (-22.4 in)
Z: 265.6 mm (10.5 in)	Z: 265.6 mm (10.5 in)

Seat Position Diagrams

SgRP Front Seat Dimension


A
SgRP
B
Y=0
C
D
D
SgRP
SgRP
X=0

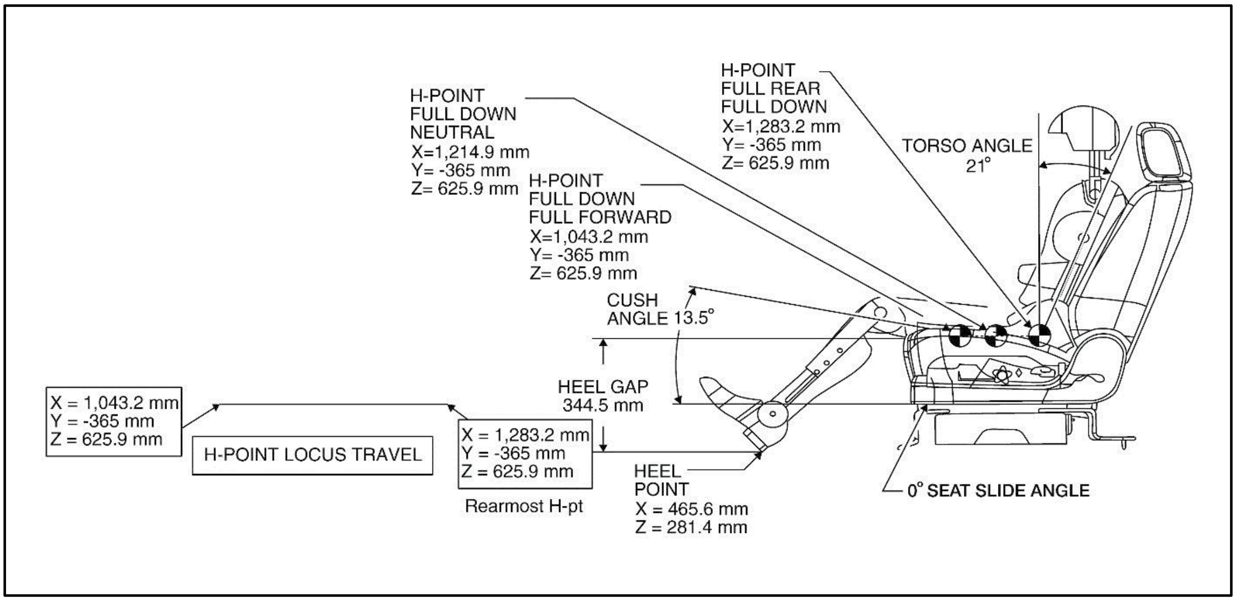
NOTE:

Seat is in full down and back position.

A. 1,336.5 mm (52.6 in) B. 428.7 mm (16.9 in)

C. 341.5 mm (13.4 in) D. 365 mm (14.4 in)

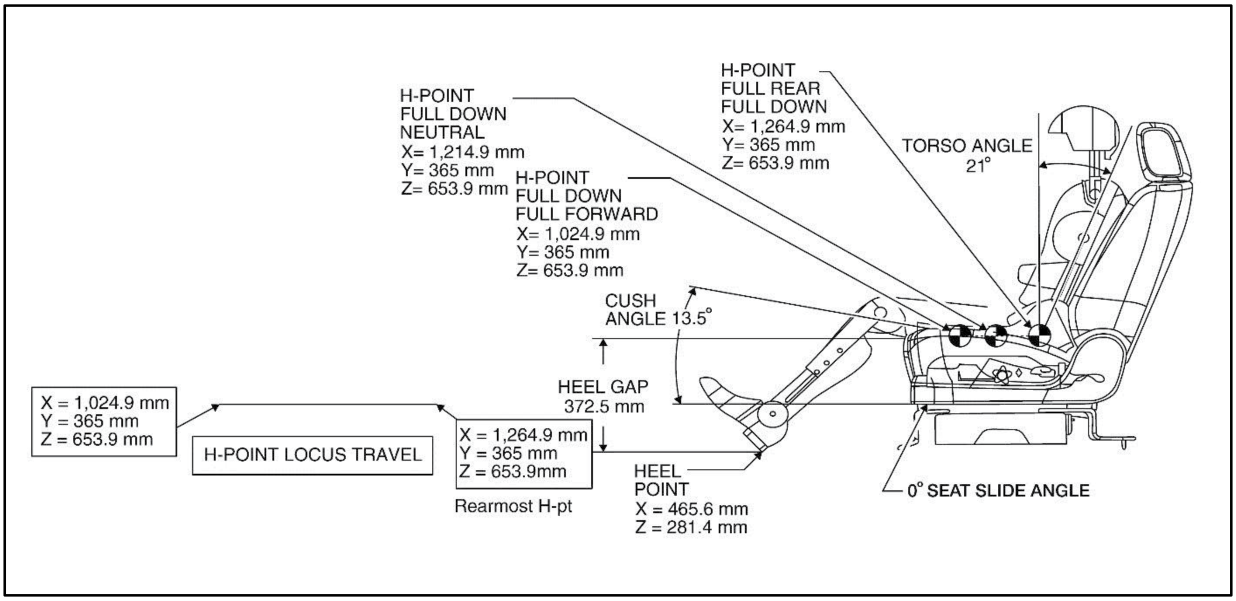
LH Manual Track


H-POINT
FULL REAR
FULL DOWN
X=1,283.2 mm
Y= -365 mm
Z= 625.9 mm
H-POINT
FULL DOWN
NEUTRAL
X=1,214.9 mm
Y= -365 mm
Z= 625.9 mm
TORSO ANGLE
21°
H-POINT
FULL DOWN
FULL FORWARD
X=1,043.2 mm
Y= -365 mm
Z= 625.9 mm
CUSH
ANGLE 13.5°
HEEL GAP
344.5 mm
X = 1,043.2 mm
Y = -365 mm
Z = 625.9 mm
H-POINT LOCUS TRAVEL
X = 1,283.2 mm
Y = -365 mm
Z = 625.9 mm
Rearmost H-pt
HEEL
POINT
X = 465.6 mm
Z = 281.4 mm
0° SEAT SLIDE ANGLE

NOTE:

The X, Y, Z values are measured from the front seat front bolt holes.

RH Manual Track


H-POINT
FULL REAR
FULL DOWN
X= 1,264.9 mm
Y= 365 mm
Z= 653.9 mm
H-POINT
FULL DOWN
NEUTRAL
X= 1,214.9 mm
Y= 365 mm
Z= 653.9 mm
TORSO ANGLE
21°
H-POINT
FULL DOWN
FULL FORWARD
X= 1,024.9 mm
Y= 365 mm
Z= 653.9 mm
CUSH
ANGLE 13.5°
HEEL GAP
372.5 mm
X = 1,024.9 mm
Y = 365 mm
Z = 653.9 mm
H-POINT LOCUS TRAVEL
X = 1,264.9 mm
Y = 365 mm
Z = 653.9mm
Rearmost H-pt
HEEL
POINT
X = 465.6 mm
Z = 281.4 mm
0° SEAT SLIDE ANGLE

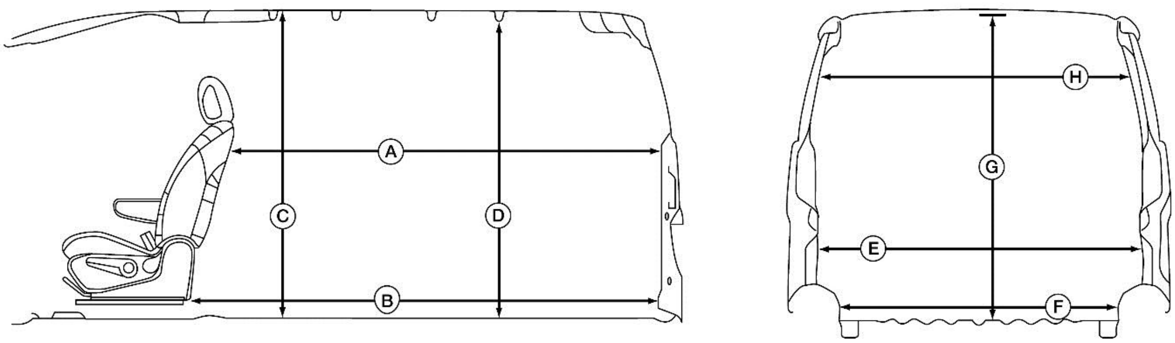
NOTE:

The X, Y, Z values are measured from the front seat front bolt holes.

CARGO AREA

Interior Dimensions

Overall



A. Length behind seat back in upright position:
  - •rear-most: 2,022 mm (79.6 in)
  - •center: 2,144 mm (84.4 in)
  - •front-most: 2,262 mm (89.1 in)

B. Maximum length at floor behind seat base: 2,103.5 mm (82.8 in)

C. Maximum cargo height 1,330 mm (52.4 in)

D. Height at rear wheel center: 1,317 mm (51.9 in)

E. Maximum width at floor:
  - •between slide doors: 1,480 mm (58.3 in)
  - •behind wheel wells 1,390.8 mm (54.8 in)

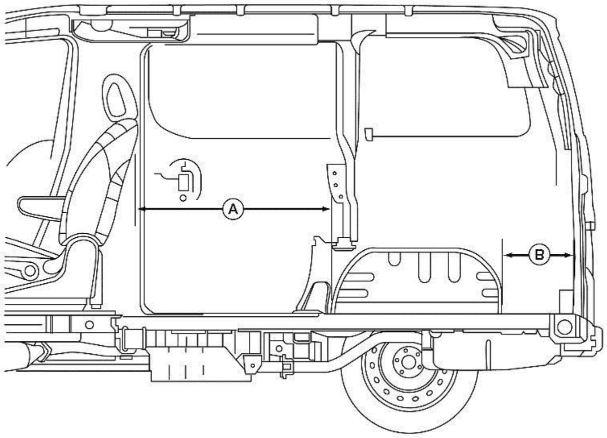
F. Width at floor between wheel wells: 1,219.4 mm (48 in)

G. Maximum height at rear cargo entrance with striker: 1,198 mm (47.2 in)

H. Maximum width at center of window opening area: 1,500 mm (59.1 in)

Wheel Well Clearance

Cutaway Side View — RH

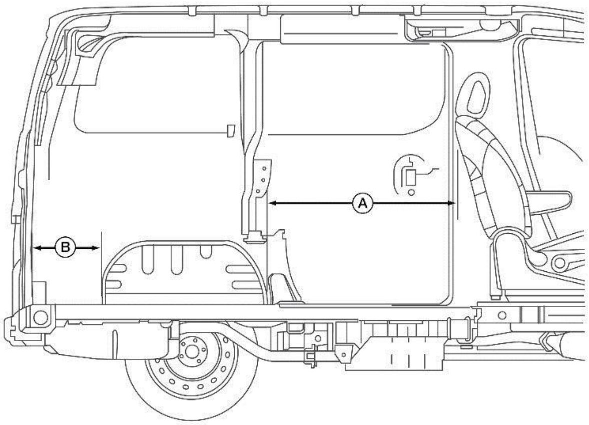


NOTE:
View from inside of vehicle.

A. Seat position: B. 296 mm (11.65 in)

- rear-most: 856 mm (33.7 in)
- center: 952 mm (37.5 in)
- front-most: 1,096 mm (43.15 in)

Cutaway Side View — LH

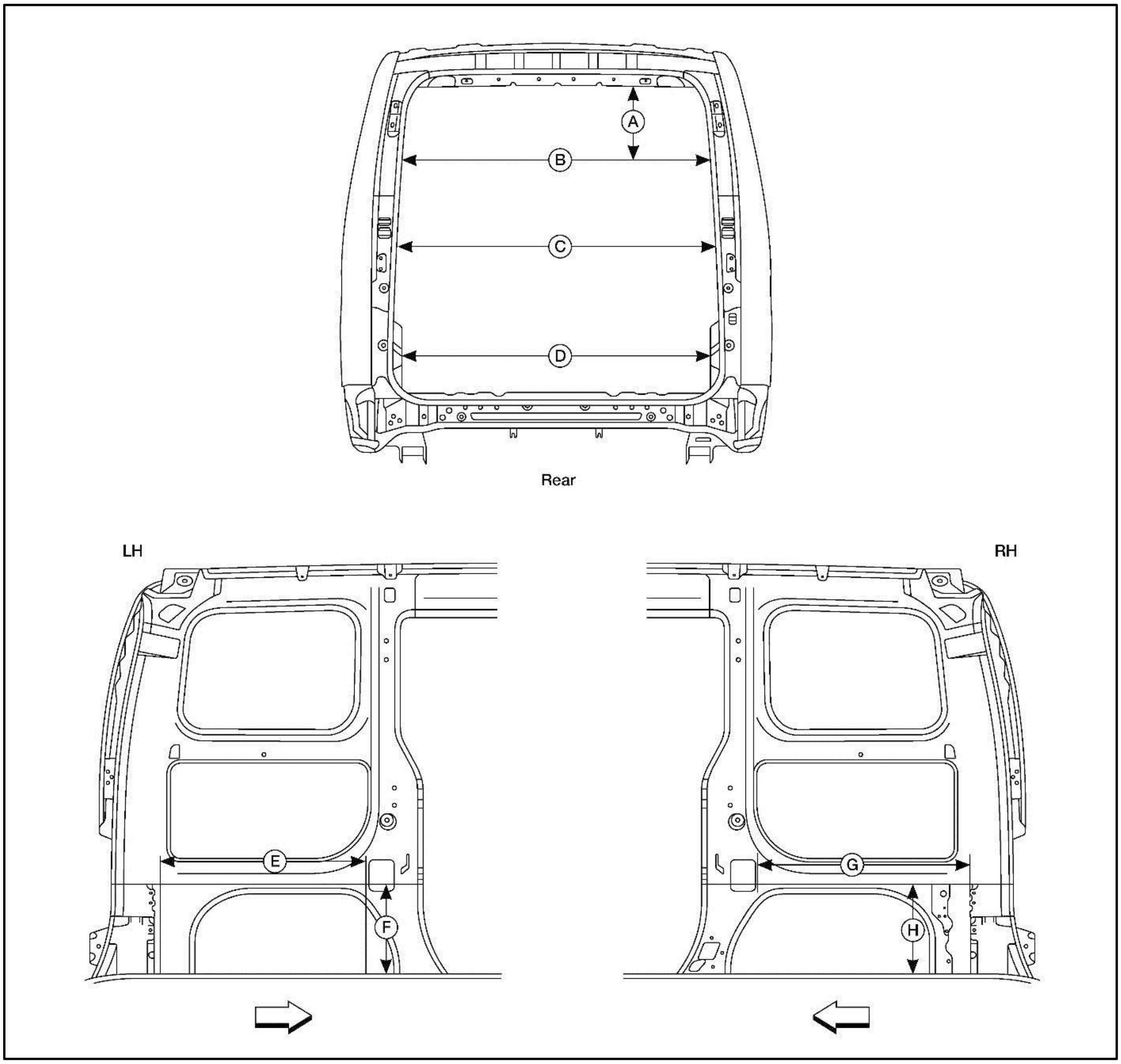


Note: View from inside of Vehicle

A. Seat position: B. 296 mm (11.65 in)

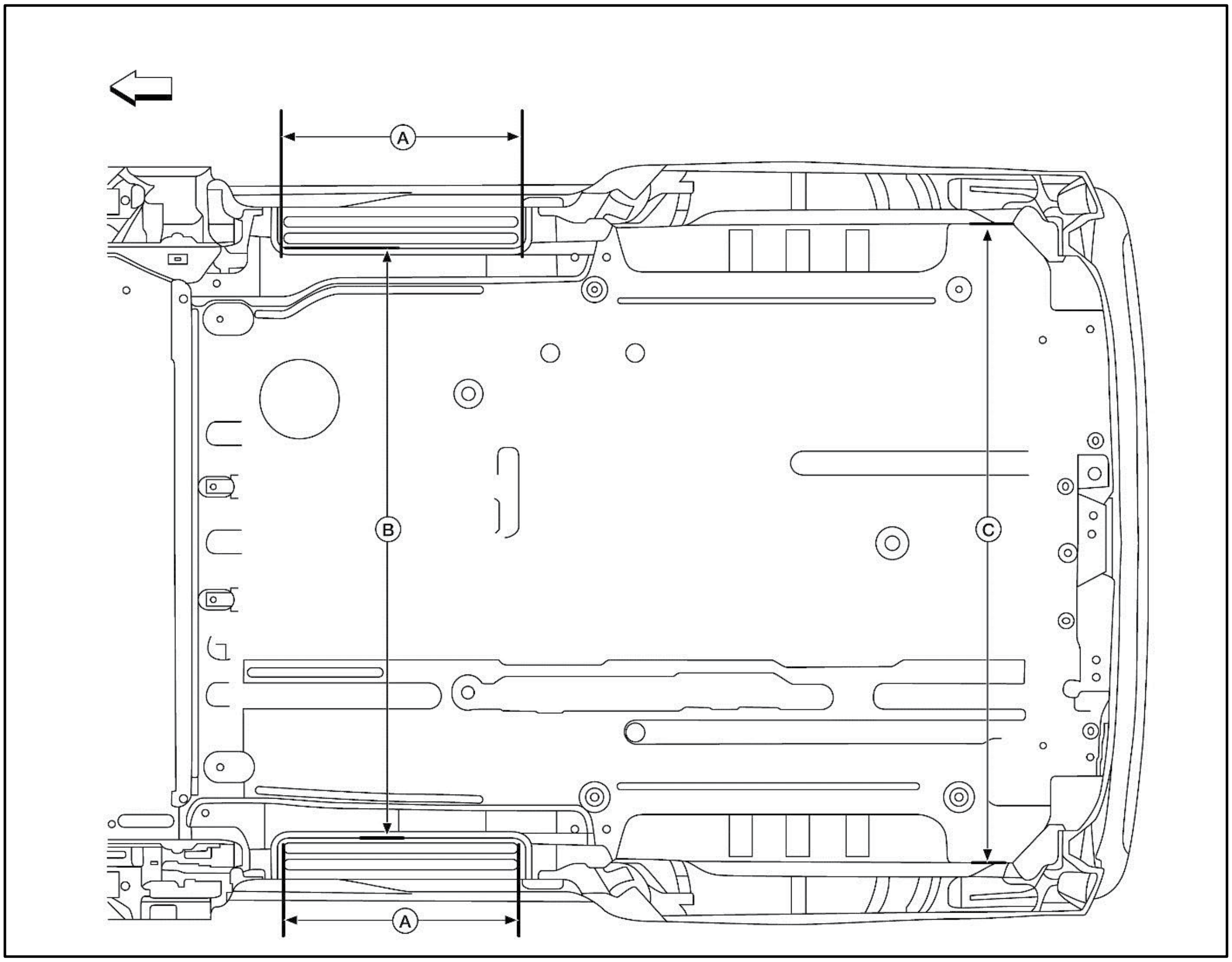
- rear-most: 856 mm (33.7 in)
- center: 952 mm (37.5 in)
- front-most: 1,096 mm (43.15 in)

Cutaway Wheel Well and Rear Views


A
B
C
D
Rear
LH
RH
E
F
G
H

A. 261.8 mm (10.3 in)
B. 1,175 mm (46.3 in)
C. 1,250 mm (49.2 in)
D. 1,260 mm (49.6 in)
E. 725 mm (28.5 in)
F. 271 mm (10.6 in)
G. 785 mm (30.9 in)
H. 288 mm (11.3 in)

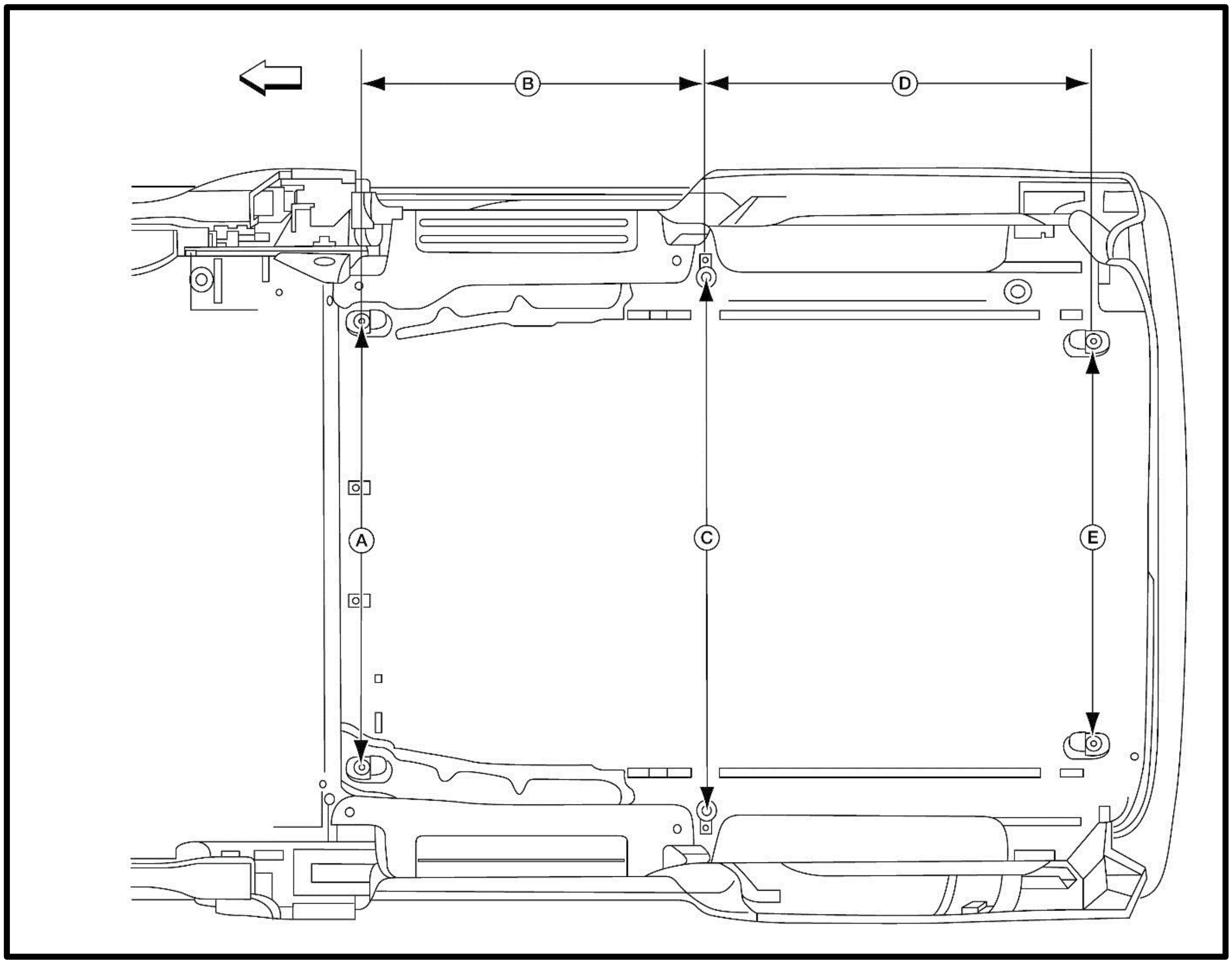
Cutaway Overhead View



A. 570 mm (22.4 in) B. 1,323 mm (52.1 in) C. 1,432 mm (56.4 in)

D-Ring Tie-Downs (If Equipped)

Cutaway Overhead View



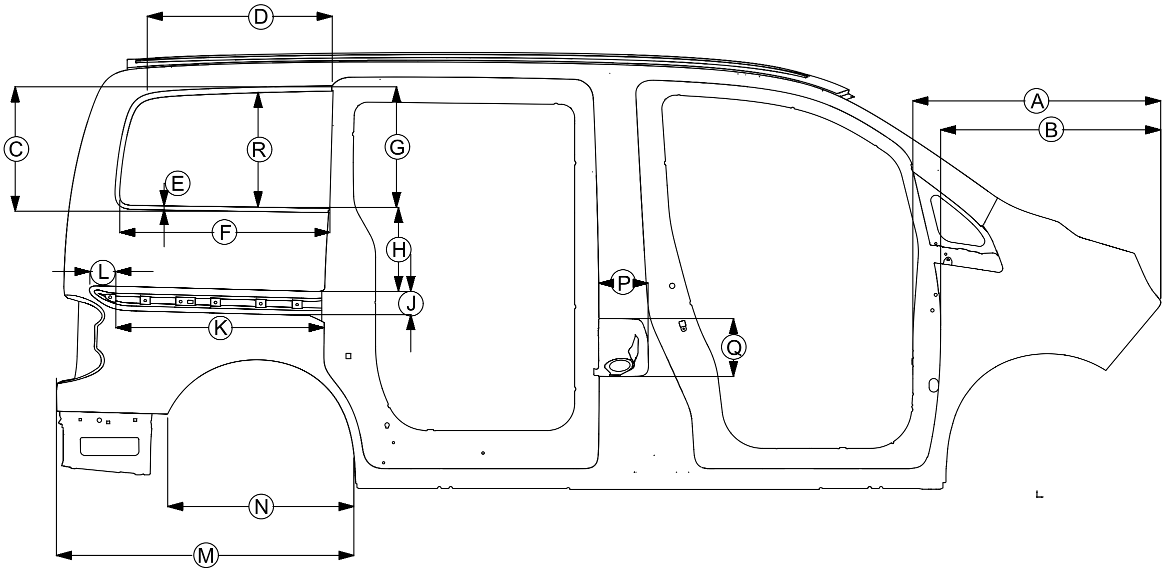
WARNING:

Do not exceed the maximum total D-ring tie down loading of 5,000 N (1,124 lbs).

*** D-ring tie down location.**

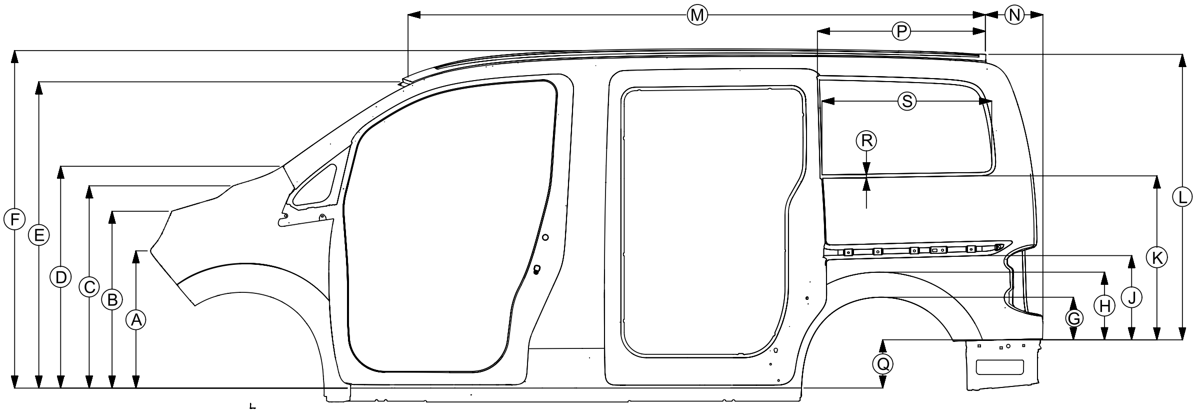
A. 1,005 mm (39.6 in)
B. 845 mm (33.3 in)
C. 1,275 mm (50.2 in)
D. 817 mm (32.2 in)
E. 1,138 mm (44.8 in)

SIGN AREA
RH Exterior Dimensions



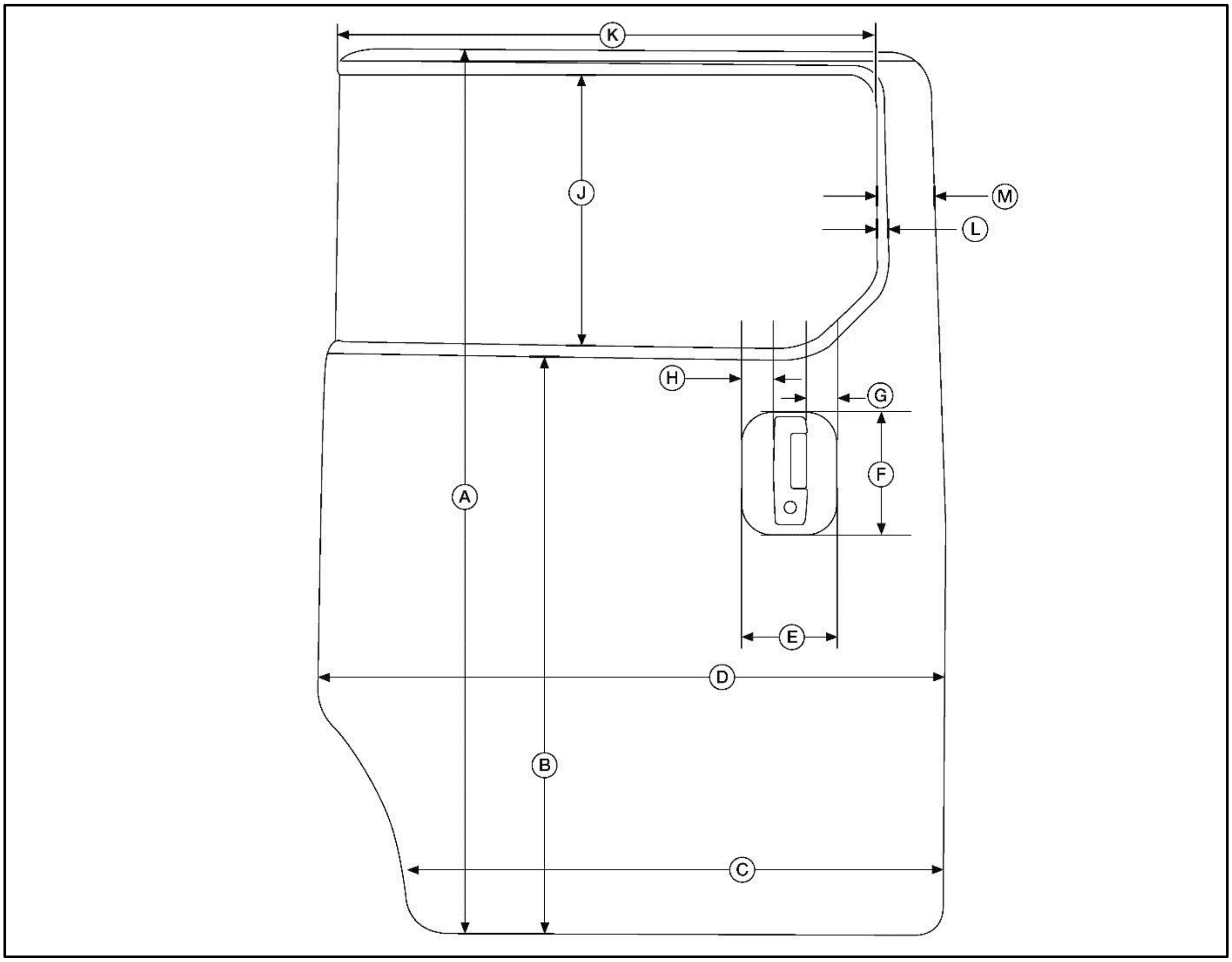
A. 917 mm (36.1 in)	**B. 814 mm (32.1 in)**	**C. 408 mm (16.1 in)**
D. 713 mm (28.1 in)	**E. Inset depth: 18 mm (0.7 in)**	**F. 781 mm (30.7 in)**
G. 450 mm (17.7 in)	**H. 300 mm (11.8 in)**	**J. 81 mm (3.2 in)**
K. 723 mm (28.5 in)	**L. 114 mm (4.5 in)**	**M 1,115 mm (43.9 in)**
N. 693 mm (27.3 in)	**P. 180 mm (7.1 in)**	**Q. 210 mm (8.3 in)**
R. 440 mm (17.3 in)		

LH Exterior Dimensions



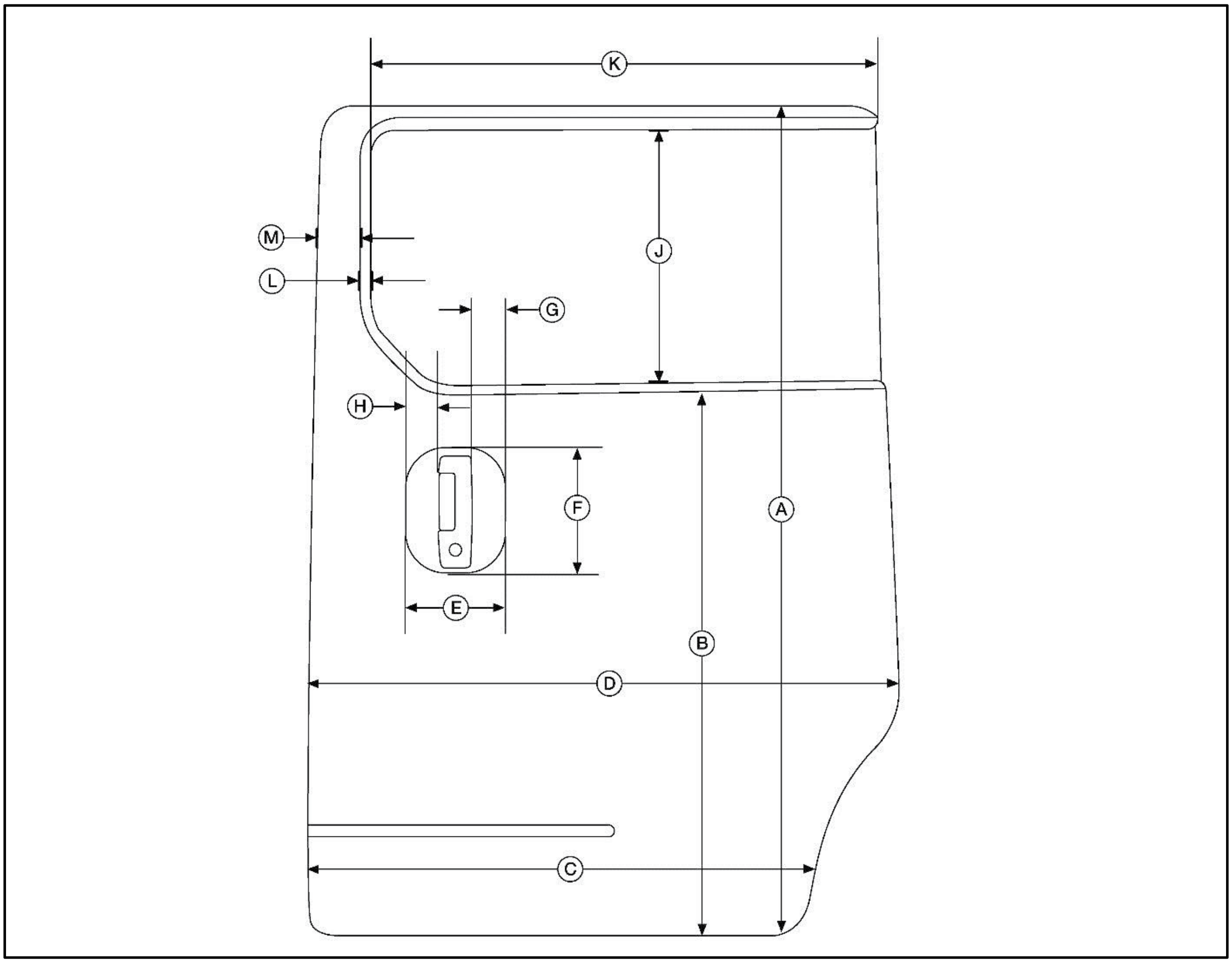
A. 628 mm (24.7 in)
B. 809 mm (31.8 in)
C. 925 mm (36.4 in)
D. 1,015 mm (40 in)
E. 1,429 mm (56.3 in)
F. 1,587 mm (62.5 in)
G. 210 mm (8.3 in)
H. 322 mm (12.7 in)
J. 383 mm (15.1 in)
K. 760 mm (29.9 in)
L. 1,330 mm (52.4 in)
M. 2,670 mm (105.1 in)
N. 250 mm (9.8 in)
P. 785 mm (30.9 in)
Q. 258 mm (10.2 in)
R. Inset depth: 18 mm (0.7)
S. 783 mm (30.8 in)

RH Slide Door Exterior Dimensions



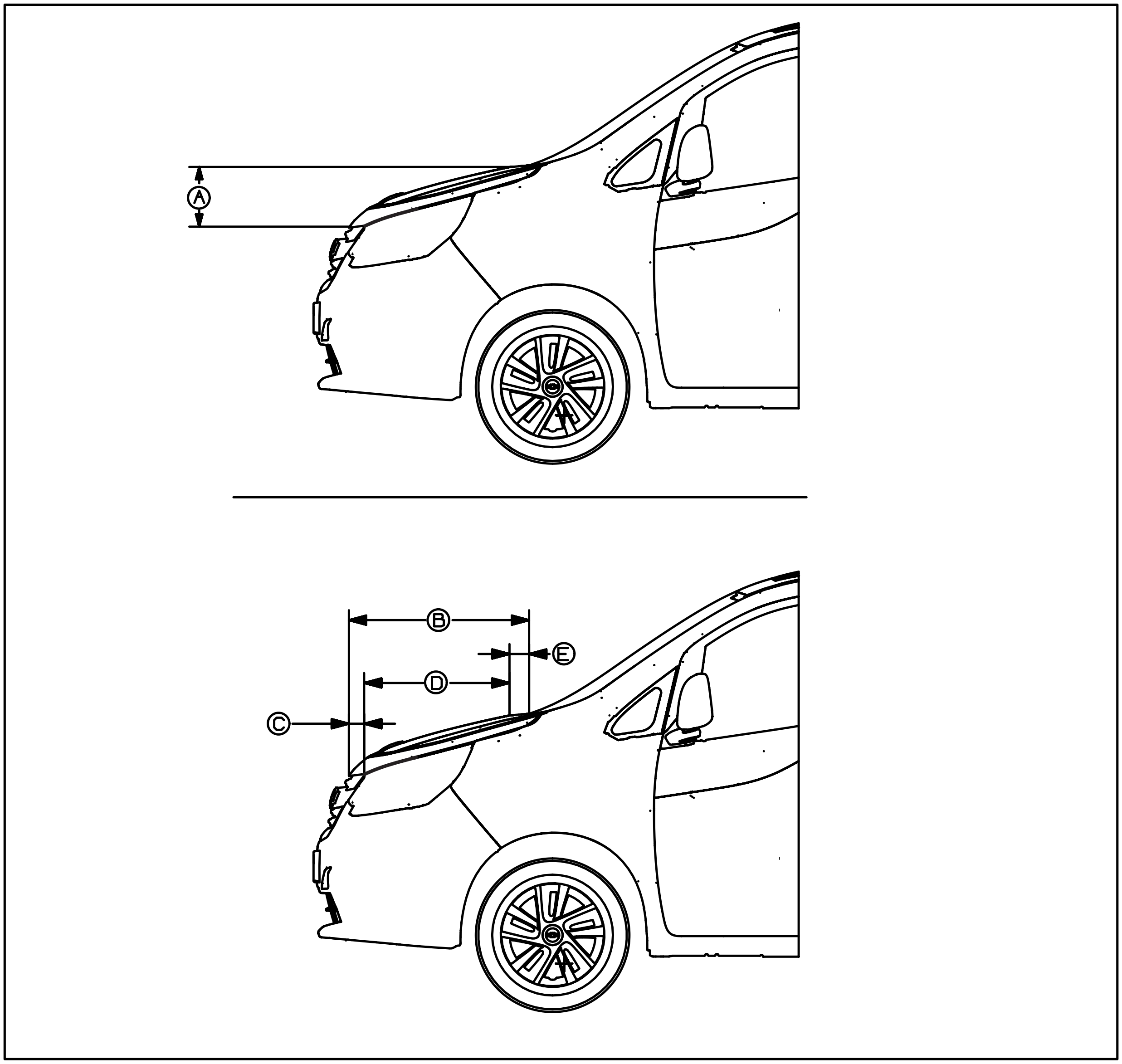
A.1,450mm(57.1in)
B.941mm(37.0in)
C.858mm(33.8in)
D.1,002mm(39.4in)
E.165mm(6.5in)
F.200mm(7.9in)
G.Insetdepth:27mm(1.1in)
H.Insetdepth:27mm(1.1in)
J.450mm(17.7in)
K.870mm(34.3in)
L.Insetdepth:14mm(0.6in)
M.75mm(3.0in)

LH Slide Door Exterior Dimensions



A. 1,450 mm (57.1 in)	B. 941 mm (37.0 in)	C. 858 mm (33.8 in)
D. 1,002 mm (39.4 in)	E. 165 mm (6.5 in)	F. 200 mm (7.9 in)
G. Inset depth: 27 mm (1.1 in)	H. Inset depth: 27 mm (1.1 in)	J. 450 mm (17.7 in)
K. 870 mm (34.3 in)	L. Inset depth: 14 mm (0.6 in)	M. 75 mm (3.0 in)

Hood Surface Exterior Dimensions



A. **241mm (9.5 in)**

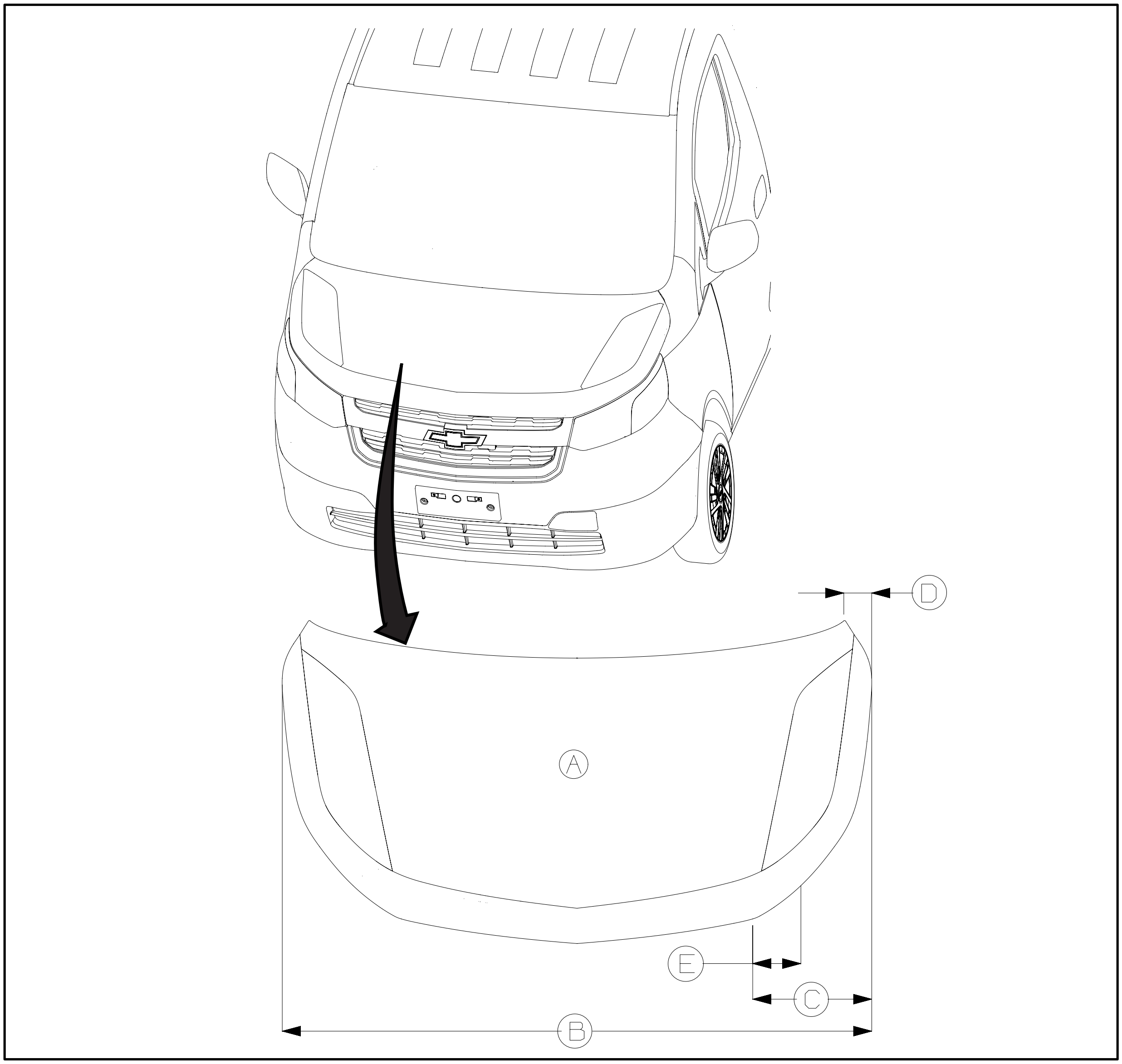
B. **729.5mm (28.7in)**

C. **61.5mm (2.4 in)**

D. **588.5mm (23.2 in)**

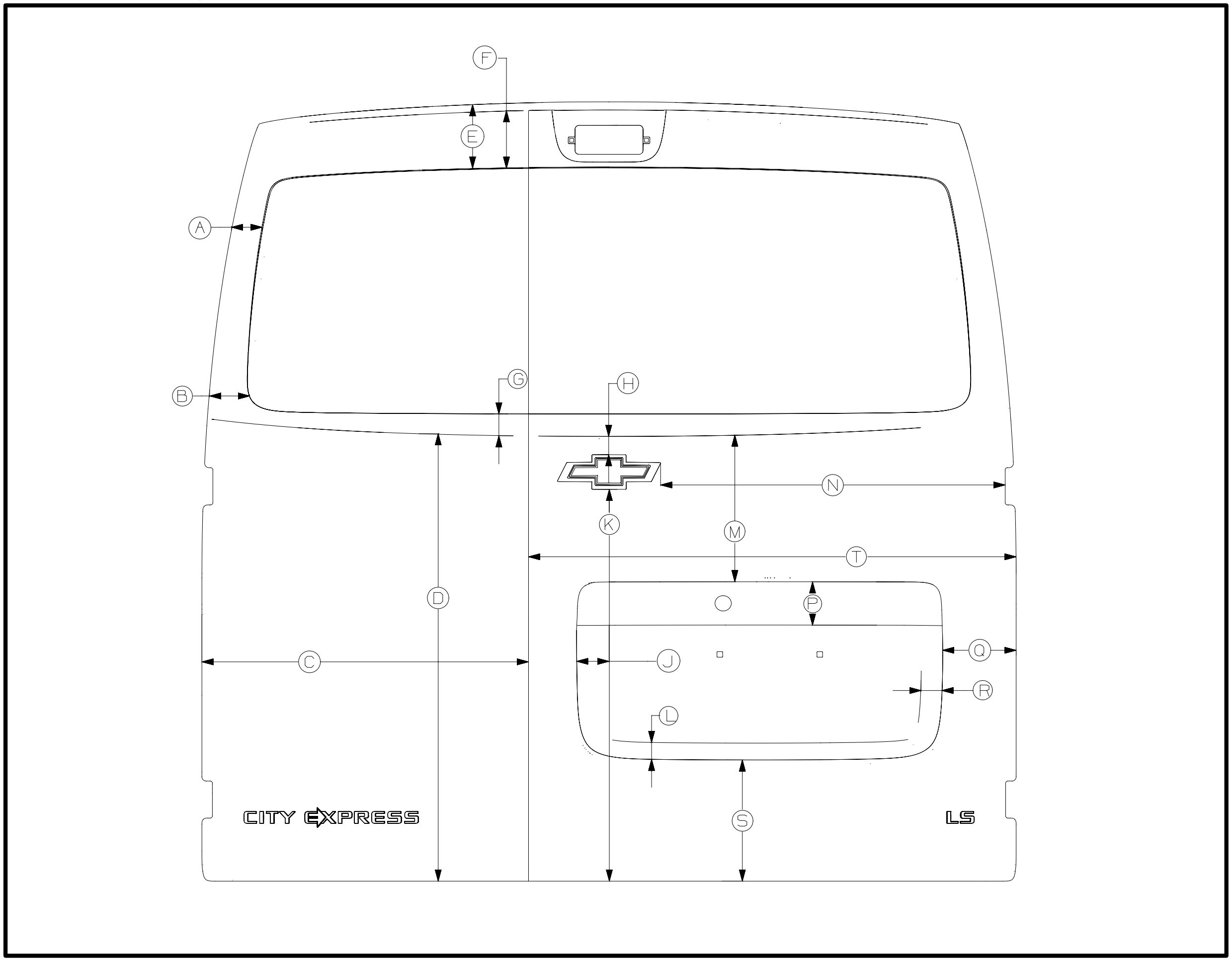
E. **79mm (3.1 in)**

Hood Surface Exterior Dimensions (continued)



A. Flat surface area: .708 m^2 (1,089.9 in^2) B. 1,509 mm (59.1 in) C. 305 mm (12.0 in)
D. 72 mm (2.8 in) E. 123 mm (4.8 in)

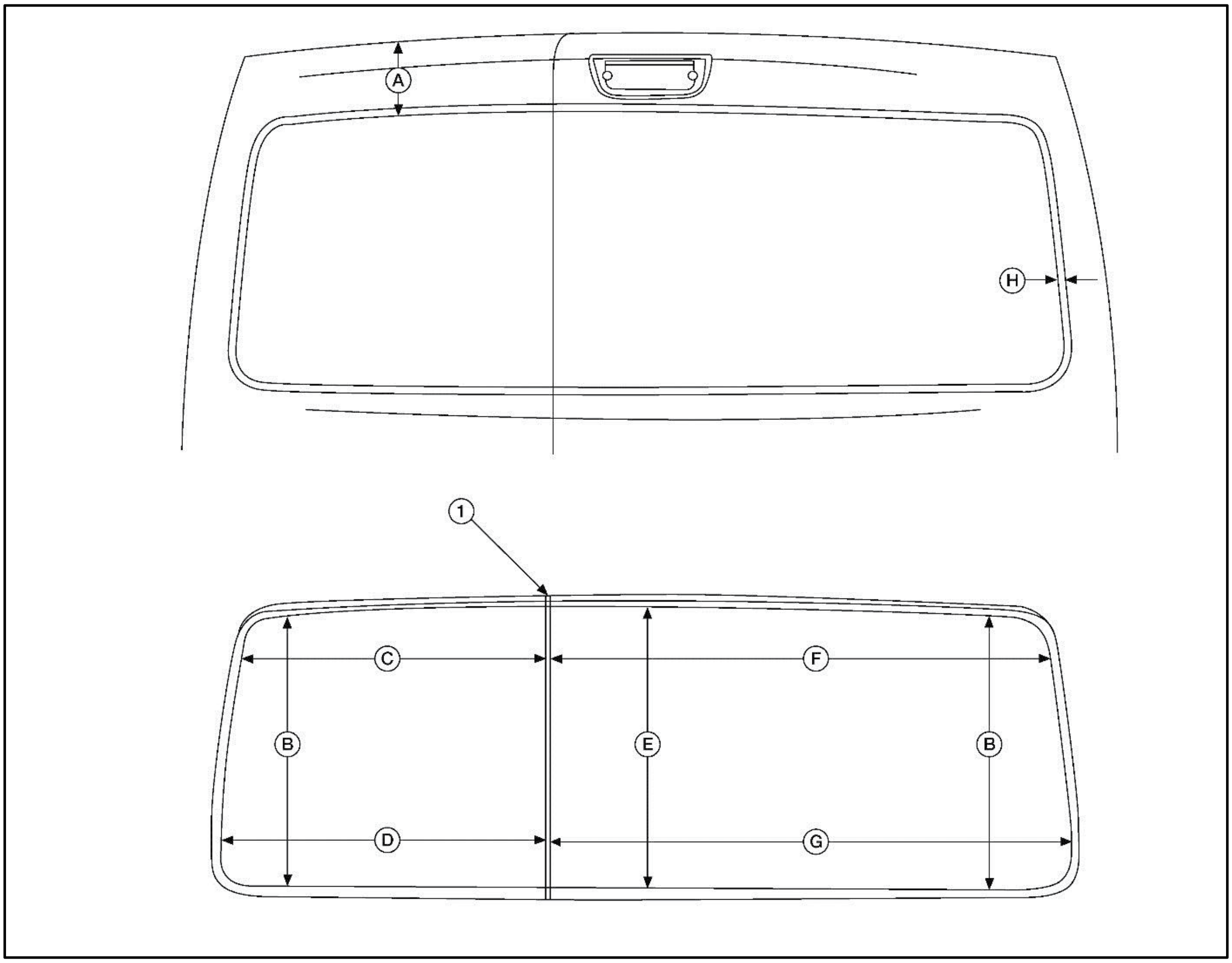
Back Door Sign Area



F
E
A
B
G
H
N
K
M
T
D
P
Q
C
J
R
L
S
CITY EXPRESS
LS

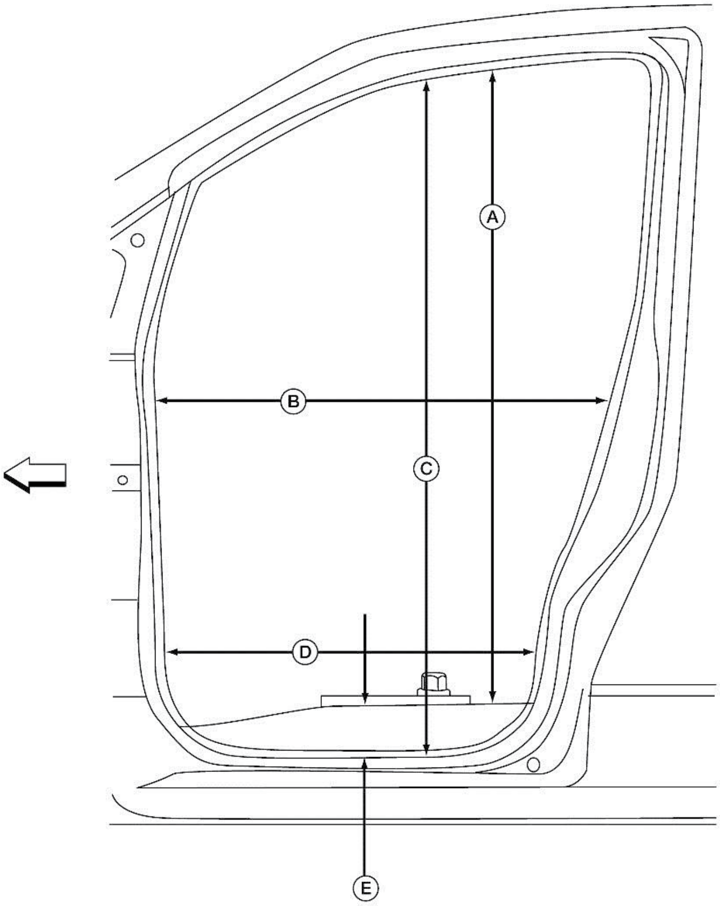
A. 50 mm (2.0 in)	B. 61 mm (2.4 in)	C. 580 mm (22.8 in)
D. 796 mm (31.3 in)	E. 128 mm (5.0 in)	F. 75 mm (3.0 in)
G. 36 mm (1.4 in)	H. 33 mm (1.3 in)	J. 70 mm (2.8 in)
K. 697 mm (27.4 in)	L. 30 mm (1.2 in)	M. 255 mm (10.0 in)
N. 613 mm (24.1 in)	P. 77 mm (3.0 in)	Q. 130 mm (5.1 in)
R. 38 mm (1.5 in)	S. 213 mm (8.4 in)	T. 875 mm (34.4 in)
U. 445 mm (17.5 in)		

Back Door Window Opening Sign Area



1. Door gap seam	A. 128 mm (5.0 in)	B. 426 mm (16.8 in)
C. 455 mm (17.9 in)	D. 488 mm (19.2 in)	E. 438 mm (17.2 in)
F. 750 mm (29.5 in)	G. 782 mm (30.8)	H. Inset depth: 11 mm (0.4 in)

Front Door Opening Measurements



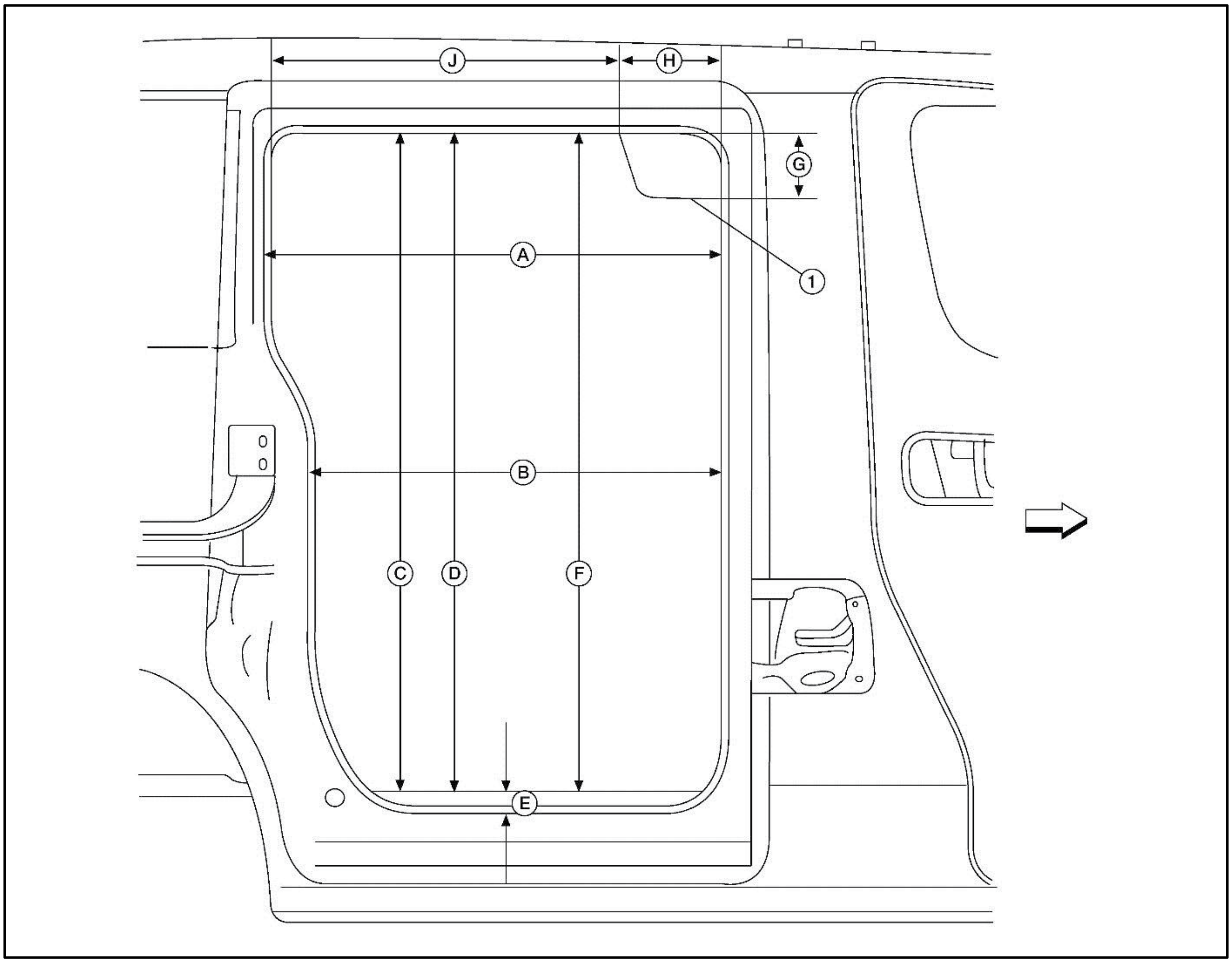
Without Door Seal and Interior Trim

A. 1,217 mm (47.9 in) B. 870 mm (34.3 in) C. 1,175 mm (46.3 in)
D. 715 mm (28.1 in) E. 88 mm (3.5 in)

With Door Seal and Interior Trim

A. 1,213 mm (47.8 in) B. 863 mm (34.0 in) C. 1,164 mm (45.8 in)
D. 706 mm (27.8 in) E. 78 mm (3.1 in)

RH Slide Door Opening Measurements — Without Slide Door Installed



Without Door Seal and Interior Trim

A. 818 mm (32.2 in) B. 735 mm (28.9 in) C. 1,181 mm (46.5 in)

D. 1,181 mm (46.5 in) E. 27 mm (1.06 in) F. 1,181 mm (46.5 in)

With Door Seal and Interior Trim

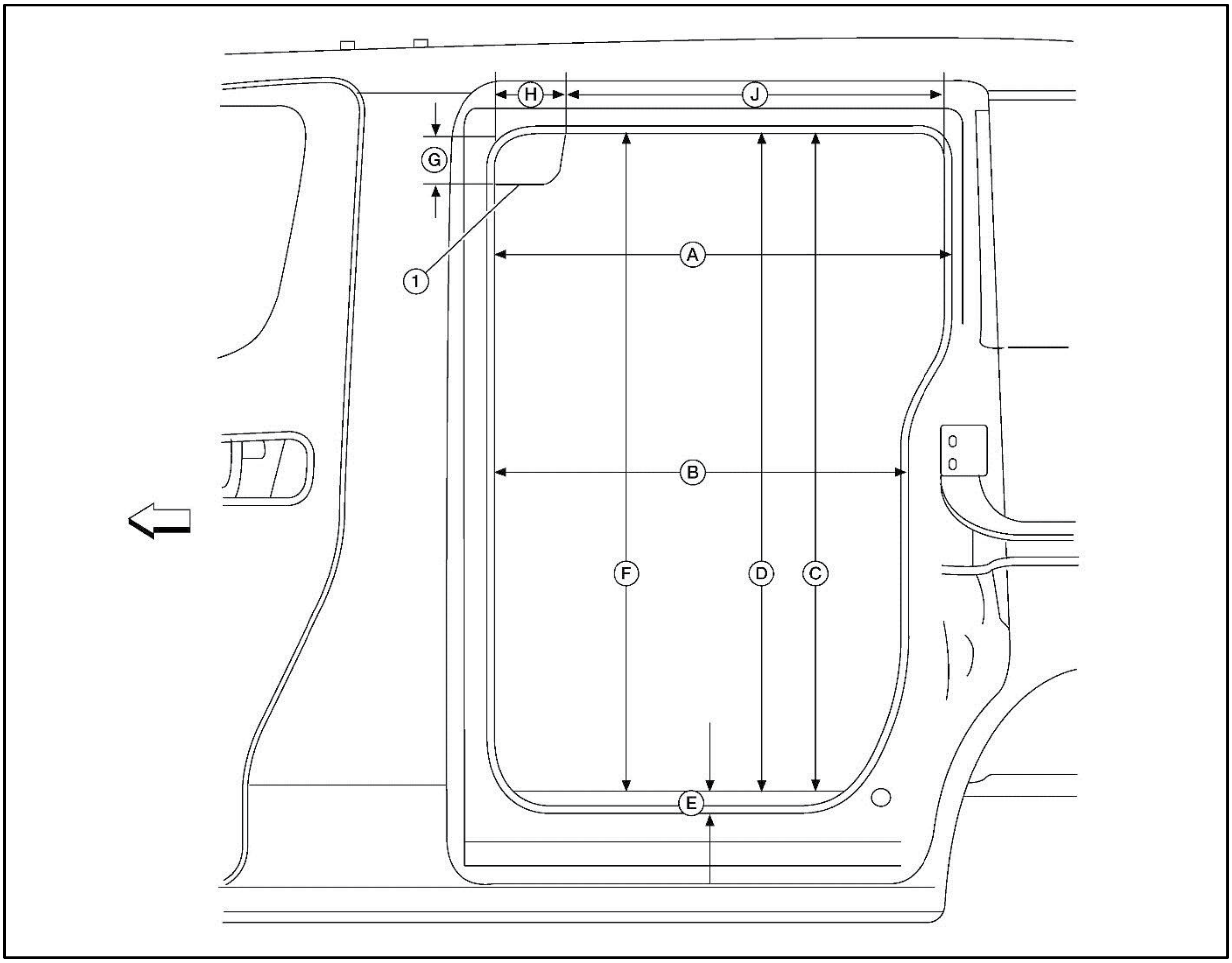
1. Headlining A. 812 mm (32.0 in) B. 728 mm (28.7 in)

C. 1,168 mm (46.0 in) D. 1,168 mm (46.0 in) E. 35 mm (1.37 in)

F. 1,168 mm (46.0 in) G. 22 mm (0.9 in) H. 190 mm (7.5 in)

J. 617 mm (24.3 in)

LH Slide Door Opening Measurements — Without Slide Door Installed



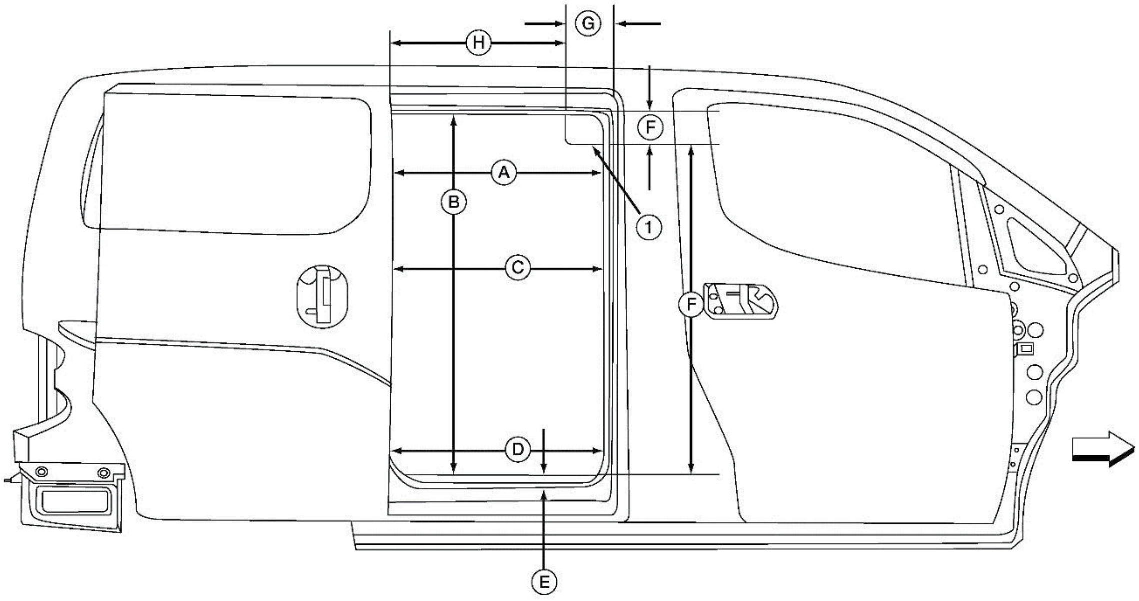
Without Door Seal and Interior Trim

A. 818 mm (32.2 in) B. 735 mm (28.9 in) C. 1,181 mm (46.5 in)
D. 1,181 mm (46.5 in) E. 27 mm (1.06 in) F. 1,181 mm (46.5 in)

With Door Seal and Interior Trim

1. Headlining A. 812 mm (32.0 in) B. 728 mm (28.7 in)
C. 1,168 mm (46.0 in) D. 1,168 mm (46.0 in) E. 35 mm (1.37 in)
F. 1,168 mm (46.0 in) G. 22 mm (0.9 in) H. 190 mm (7.5 in)
J. 617 mm (24.3 in)

RH Slide Door Opening Measurements — With Slide Door Installed



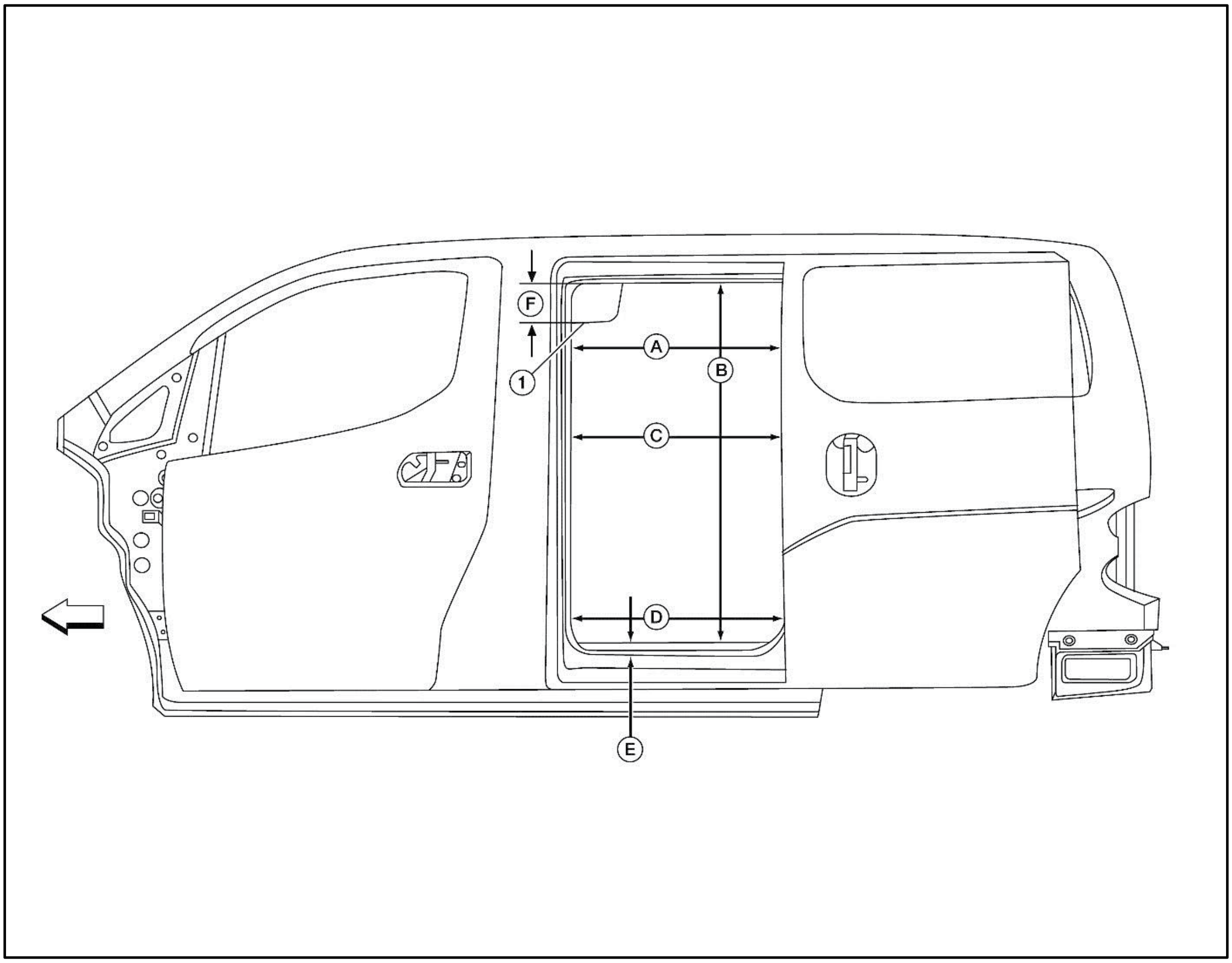
Without Door Seal and Interior Trim

A. 623 mm (24.5 in) B. 1,181 mm (46.5 in) C. 622 mm (24.5 in)
D. 624 mm (24.6 in) E. 27 mm (1.06 in)

With Door Seal and Interior Trim

1. Headlining A. 620 mm (24.4 in) B. 1,168 mm (46.0 in)
C. 620 mm (24.4 in) D. 622 mm (24.5 in) E. 35 mm (1.37 in)
F. 22 mm (0.9 in) G. 196 mm (7.7 in) H. 613 mm (24.1 in)

LH Slide Door Opening Measurements — With Slide Door Installed



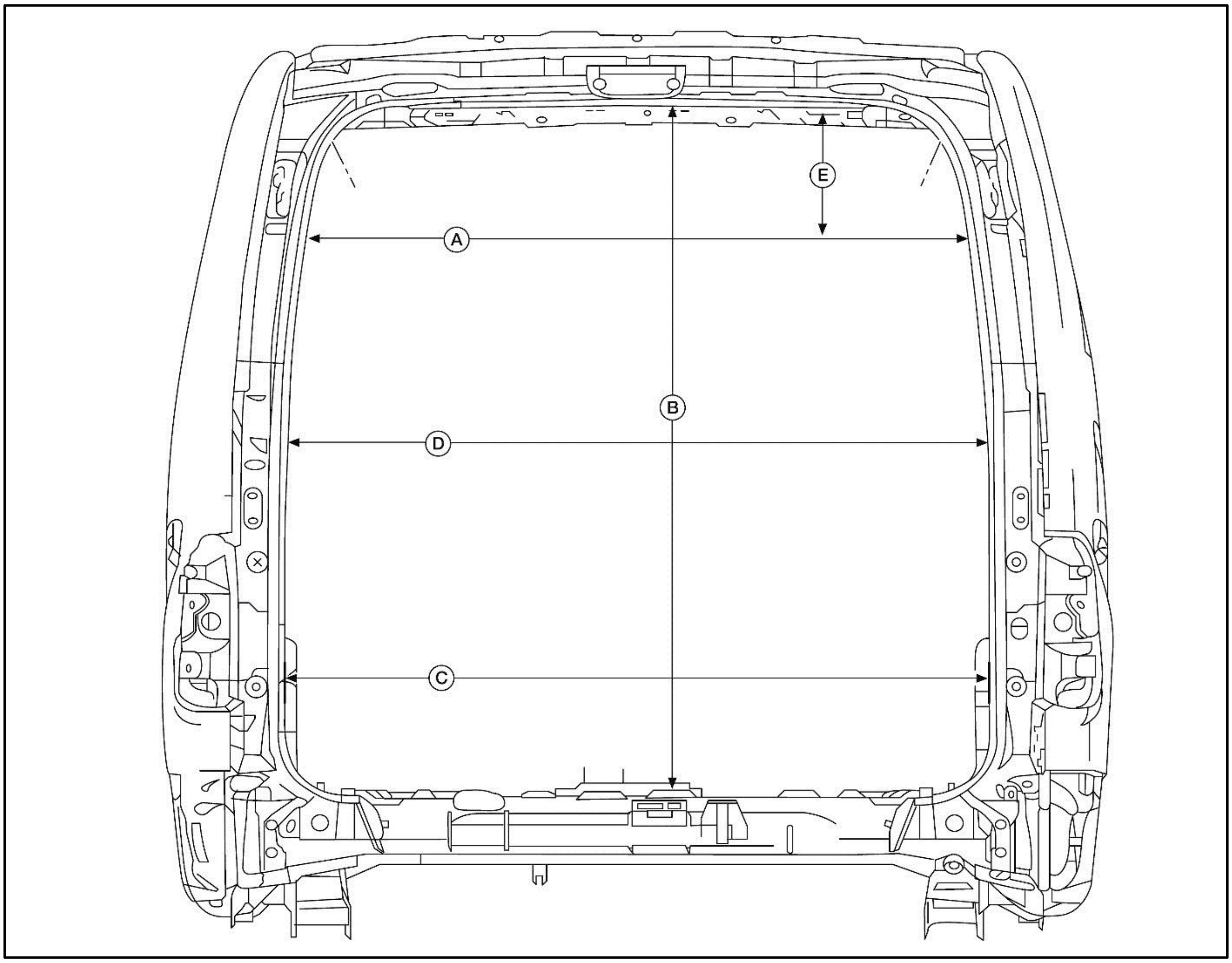
Without Door Seal and Interior Trim

A. 623 mm (24.5 in) B. 1,181 mm (46.5 in) C. 622 mm (24.5 in)
D. 624 mm (24.6 in) E. 27 mm (1.06 in)

With Door Seal and Interior Trim

1. Headlining A. 620 mm (24.4 in) B. 1,168 mm (46.0 in)
C. 620 mm (24.4 in) D. 622 mm (24.5 in) E. 35 mm (1.37 in)
F. 22 mm (0.9 in) G. 196 mm (7.7 in) H. 613 mm (24.1 in)

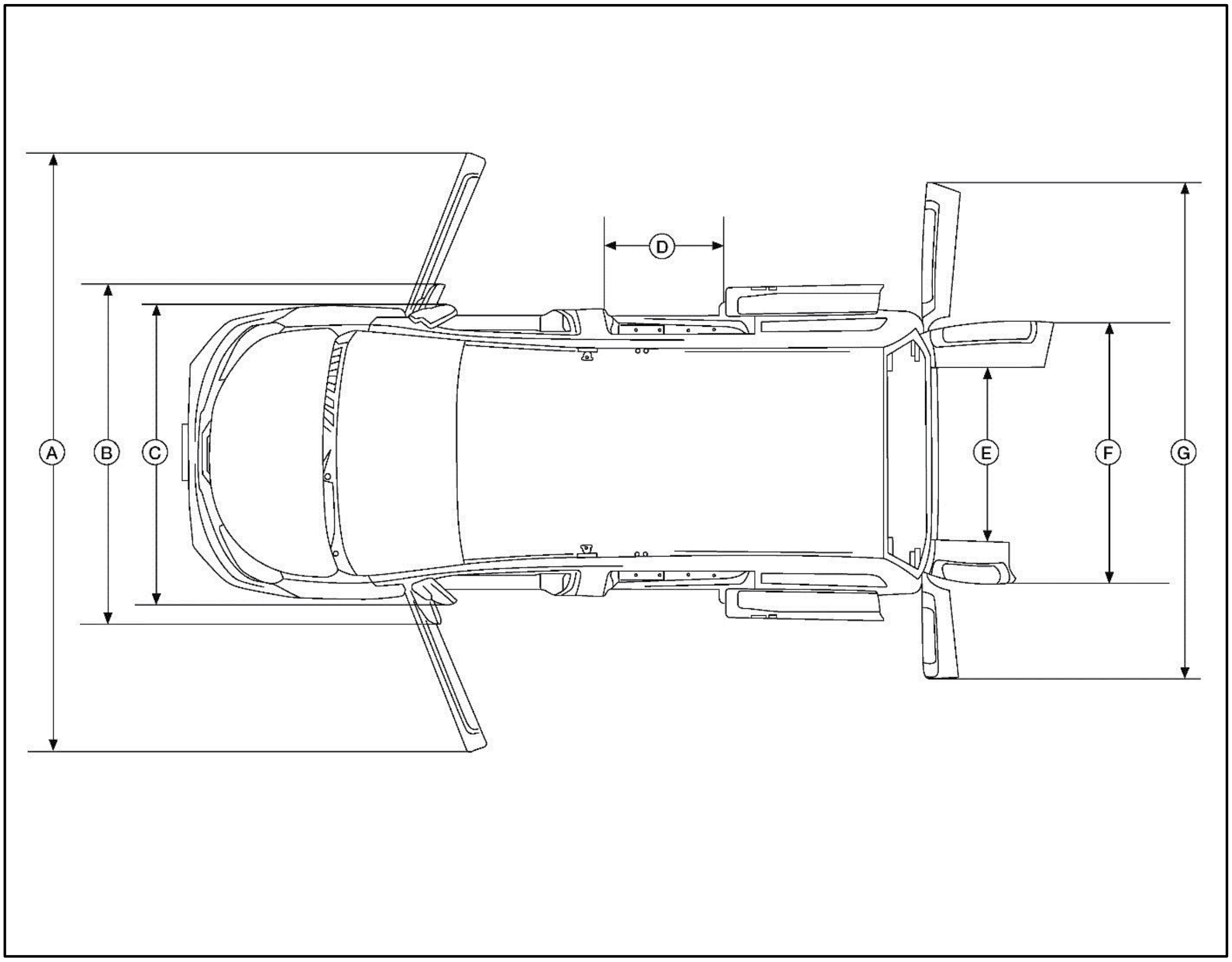
Back Door Opening Measurements



A. 1,175 mm (46.3 in)
B. 1,238 mm (48.75 in)
C. 1,260 mm (49.6 in)
D. 1,250 mm (49.2 in)
E. 193 mm (7.6 in)

Doors and Mirrors Dimensions

Overhead View



A. 3,523 mm (138.7 in)

B. With Mirrors Unfolded: 2,010 mm (79.1 in)

C. With Mirrors Folded: 1,868 mm (73.54 in)

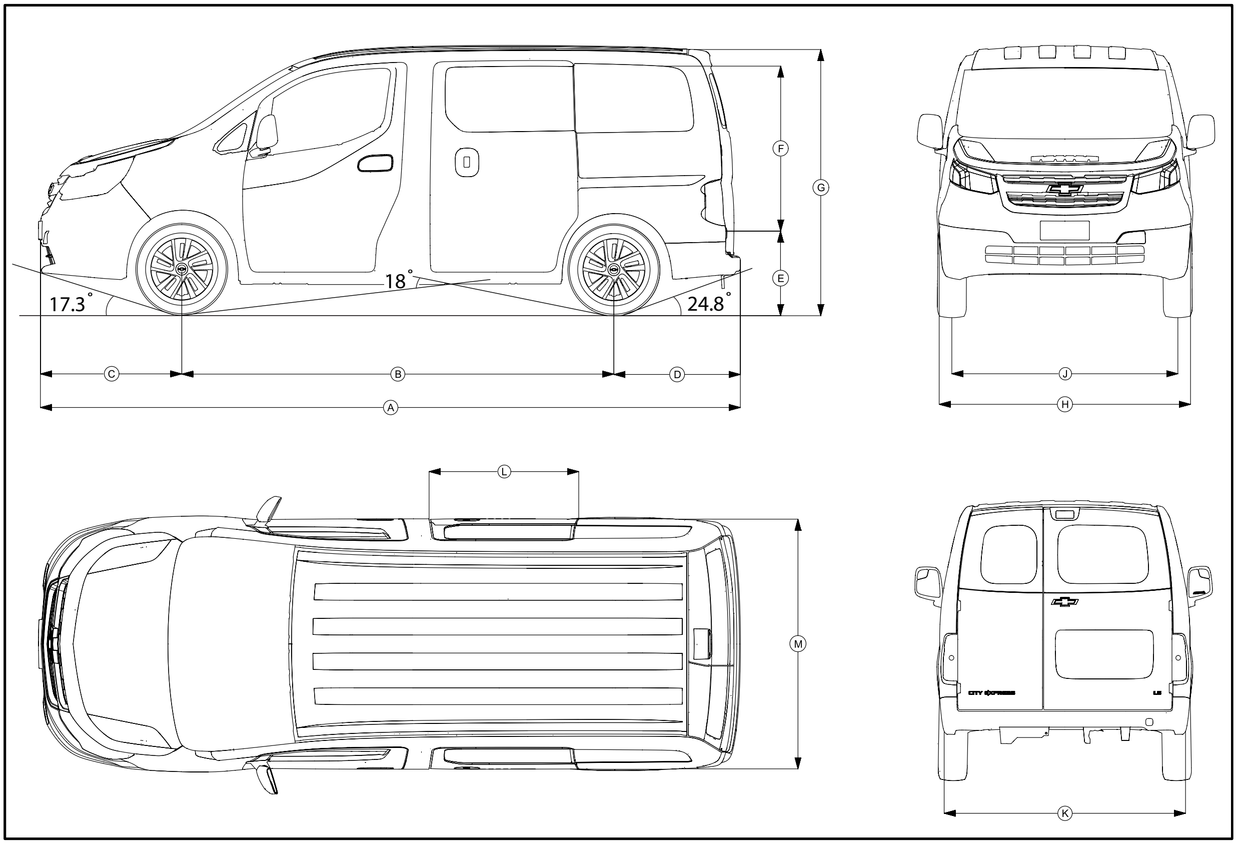
D. 671 mm (26.4 in)

E. 1,019 mm (40.1 in)

F. 1,537 mm (60.5 in)

G. 2,919 mm (114.9 in)

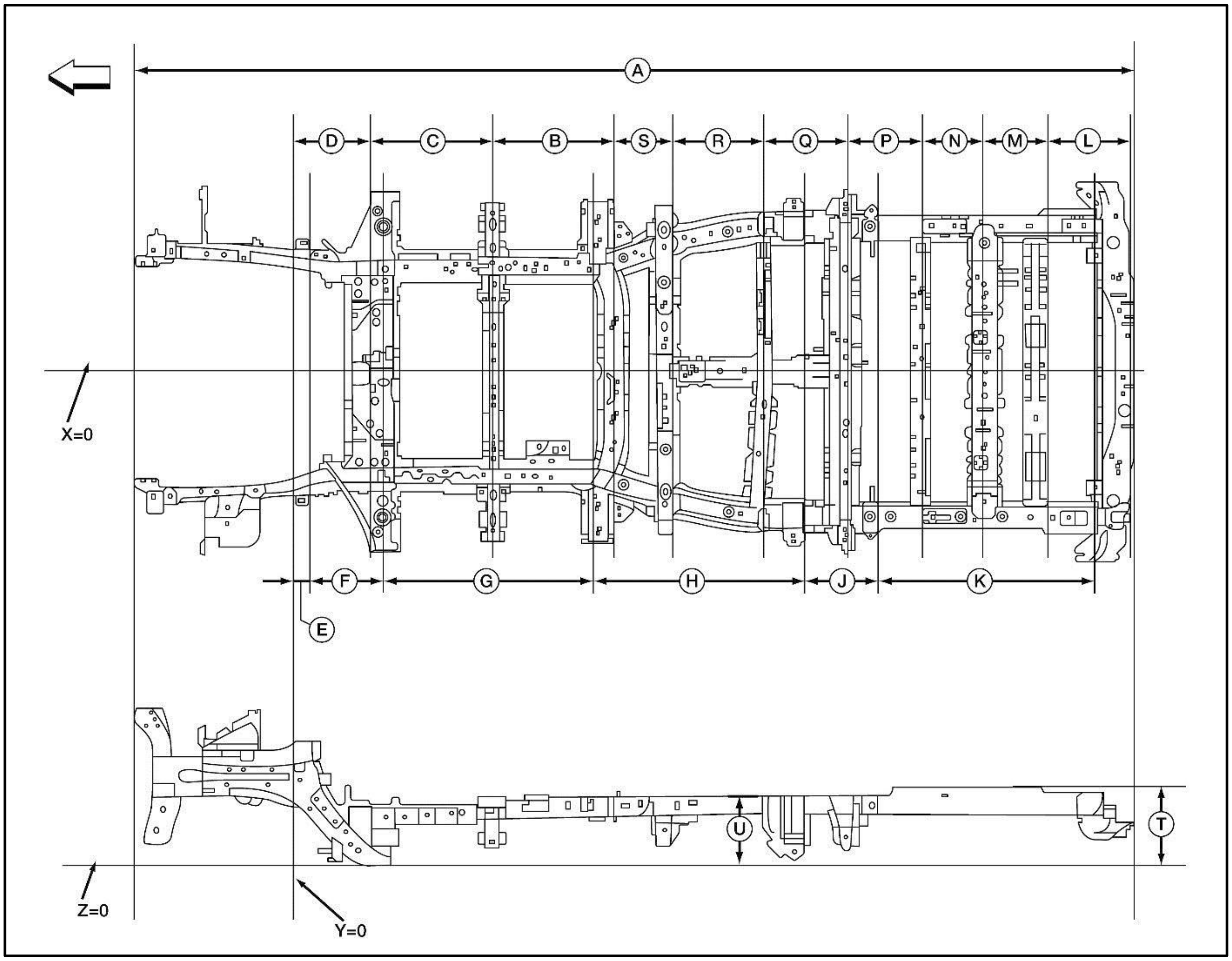
Exterior Overall Dimensions



A. 4,729 mm (186.3 in)
B. 2,925 mm (115.2 in)
C. 955 mm (37.6 in)
D. 839.3 mm (33 in)
E. 535.7 mm (21 in)
F. 1,226.7 mm (48.3 in)
G. 1,871.7 mm (73.7 in)
H. Between front fender outboard edges: 1,729.5 mm (68.1 in)
J. 1,525 mm (60 in)
K. 1,520 mm (59.8 in)
L. 996.6 mm (39.2 in)
M. 1,710 mm (67.32 in)

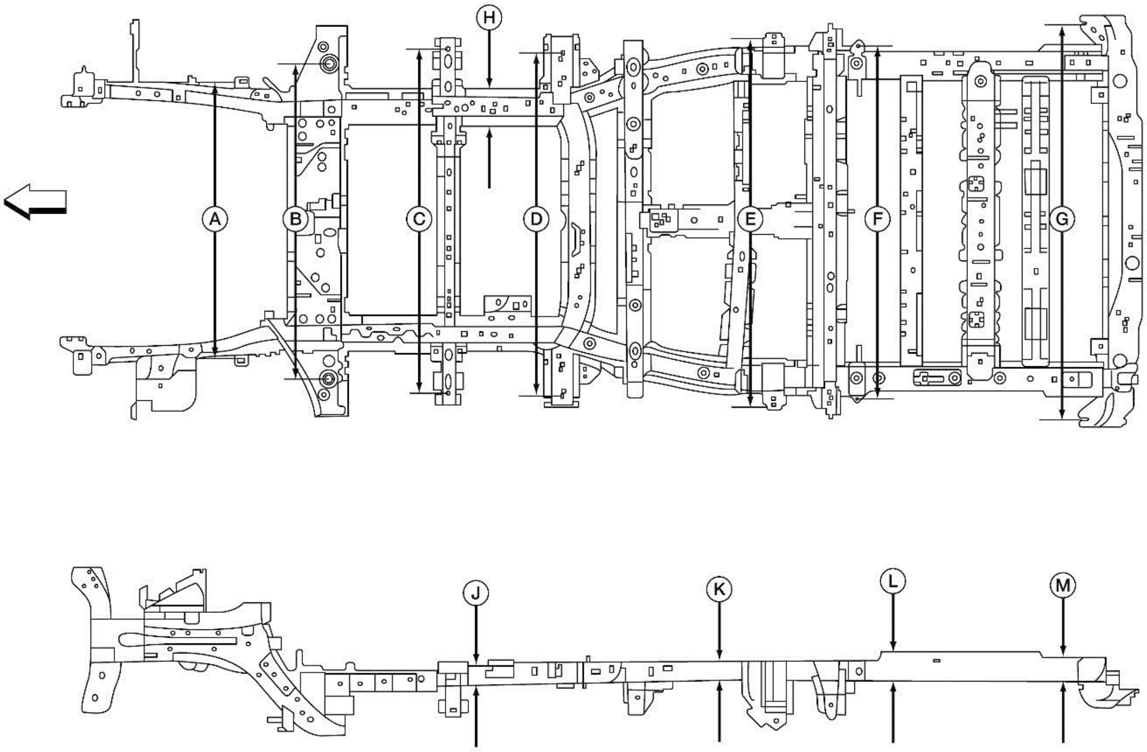
UNIBODY AND FRAME

Cross-member and Body Mount Dimensions



A. 4,311.65 mm (169.75 in) B. 520 mm (20.5 in) C. 508.05 mm (20 in)
D. 376.94 mm (14.84 in) E. 68.14 mm (2.68 in) F. 343.87 mm (13.5 in)
G. 472.97 mm (18.6 in) H. 844.21 mm (33.23 in) J. 329.36 mm (12.9 in)
K. 909.28 mm (35.8 in) L. 383.22 mm (15.08 in) M. 220.22 mm (8.67 in)
N. 272.91 mm (10.75 in) P. 326.32 mm (12.85 in) Q. 339.07 mm (13.35 in)
R. 442.02 mm (17.4 in) S. 220.01 mm (8.66 in) T. 305.8 mm (12 in)
U. 268.69 mm (10.6 in)

Cross-member and Body Mount Dimensions (continued)



NOTE:
Floor sheet metal removed for clarity.

A. 1,009 mm (39.7 in)
B. 1,134 mm (44.6 in)
C. 1,250 mm (49.2 in)
D. 1,225 mm (48.2 in)
E. 1,331 mm (52.4 in)
F. 1,275.4 mm (50.2 in)
G. 1,428 mm (56.2 in)
H. 70.22 mm (2.7 in)
J. 69.74 mm (2.74 in)
K. 71.46 mm (2.8 in)
L. 96.96 mm (3.8 in)
M. 91.31 mm (3.6 in)

FUEL SYSTEMS

FUEL SYSTEM PRECAUTIONS

General

Modifications in the fuel system are not recommended, either in the circuit or the components.

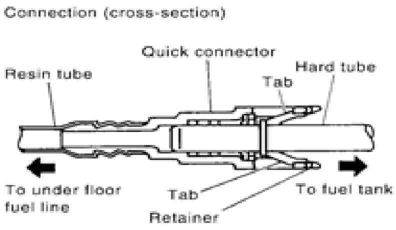
WARNING:

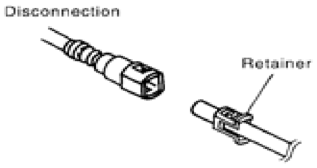
When replacing fuel line parts, be sure to observe the following:
- Put a “CAUTION: FLAMMABLE” sign in the workshop.
- Be sure to work in a well-ventilated area and furnish workshop with a CO2 fire extinguisher.
- Do not smoke while servicing fuel system. Keep open flames and sparks away from the work area.

WARNING:

- Before removing fuel line parts, carry out the following procedures:
- Put drained fuel in an explosion-proof container and put the lid on securely. Keep the container in safe area.

Release fuel pressure from the fuel lines.
Refer to the Fuel Pressure Release Procedure (TBD) in this section.





- Disconnect the battery negative terminal.

- Always replace O-rings and clamps with new ones.

- Do not kink or twist hoses when they are being installed.

- After connecting the fuel tube quick connectors, make sure the quick connectors are secure. Ensure that the connector and resin tube do not contact any adjacent parts.

- After installing tubes, make sure there is no fuel leakage at connections in the following steps:

- Apply fuel pressure to fuel lines by turning ignition switch ON (with engine stopped). Then check for fuel leaks at connections.

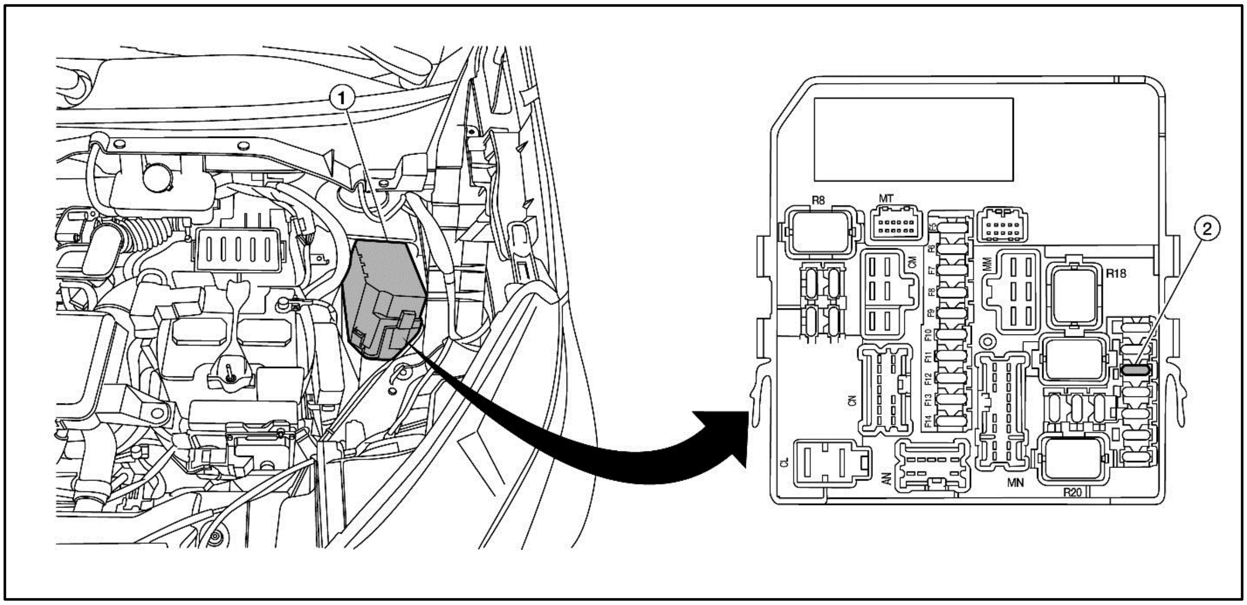
- Start the engine and rev it up and check for fuel leaks at connections.

- Use only a Genuine OEM fuel filler cap as a replacement. (If an incorrect fuel filler cap is used, the MIL may come on.)

- For servicing Evaporative Emission System parts, refer to the EC section in the service manual.

- For servicing On Board Refueling Vapor Recovery (ORVR) parts, refer to the EC section in the service manual.

Fuel Pressure Release Procedure


1
R8
MT
F5
F6
F7
F8
F9
F10
F11
F12
F13
F14
CM
MM
R18
2
CN
CL
AN
MN
R20

1. Intelligent Power Distribution Module Engine Room (IPDM E/R)   2. Fuel pump fuse 20 (15A)

1. Remove fuel pump fuse (2) located in IPDM E/R (1).

2. Start engine.

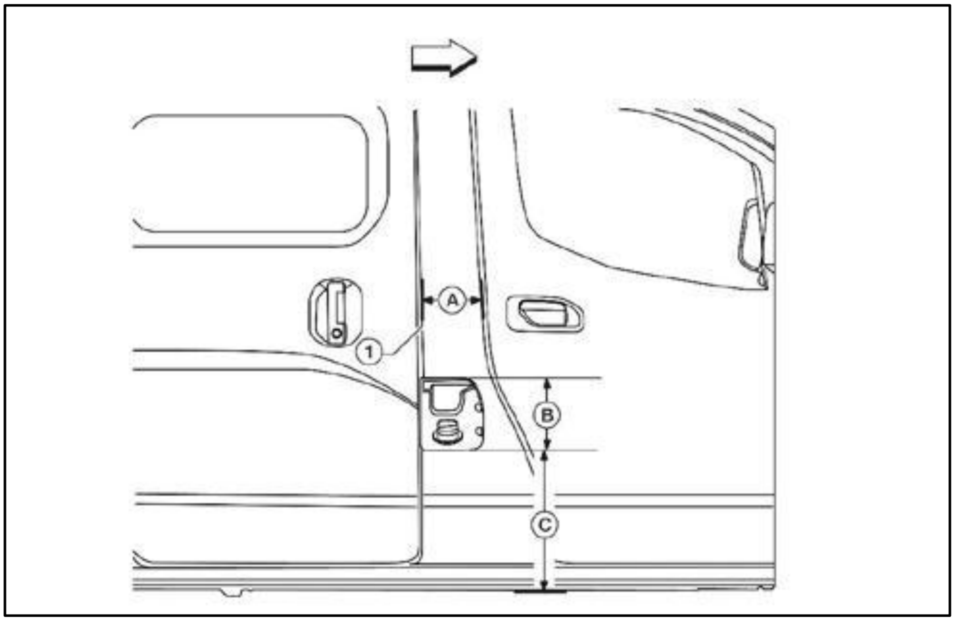
3. After engine stalls, crank it two or three times to release all fuel pressure.

4. Turn ignition switch OFF.

5. Reinstall fuel pump fuse after servicing fuel system.

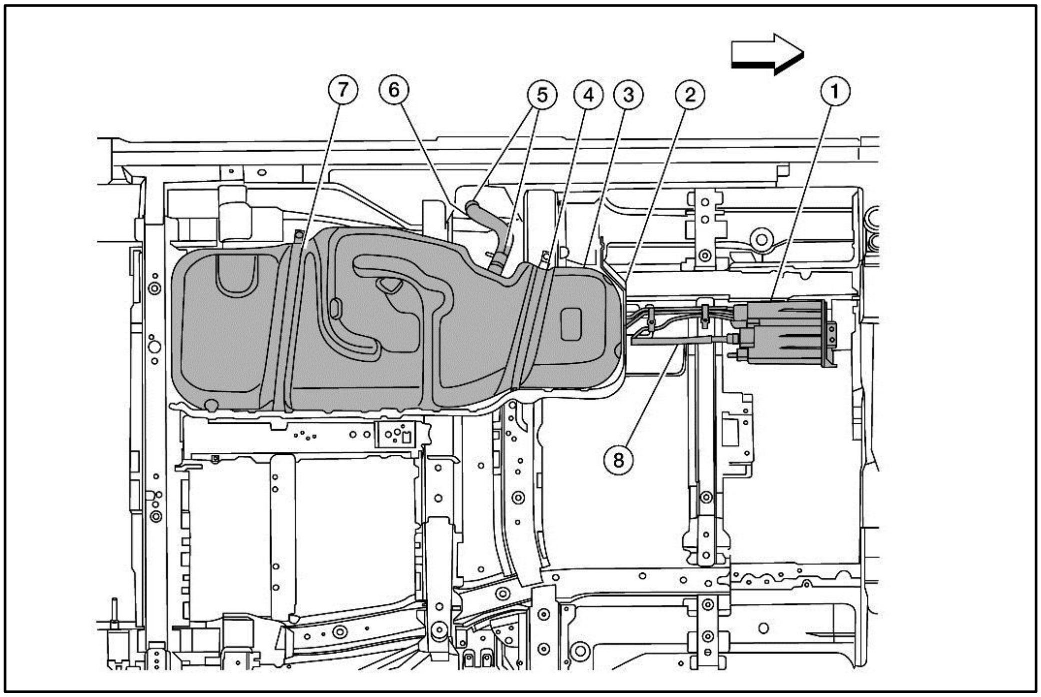
FILLER NECK AREAS

Chassis



A. 195 mm (7.7 in)
B. 207 mm (8.1 in)
C. 430 mm (16.9 in)
1. B pillar rear edge

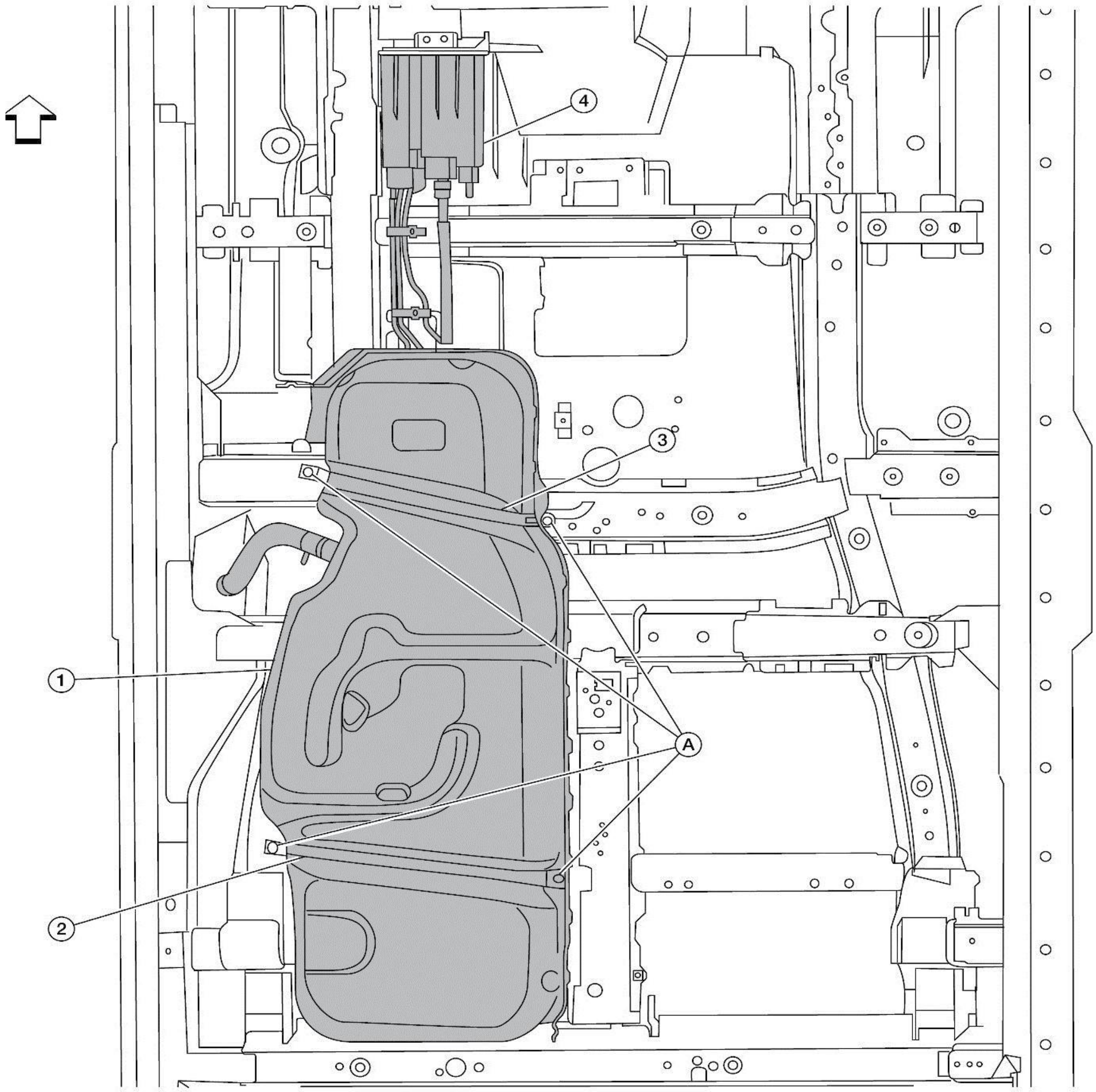
Fuel Filler Pipe and EVAP Canister Location



1. EVAP canister assembly	2. Fuel tank protector	3. Fuel tank
4. Front tank strap	5. Clamp	6. Fuel filler hose
7. Rear tank strap	8. EVAP vent tube	

TANK LOCATION

Tank Mounting



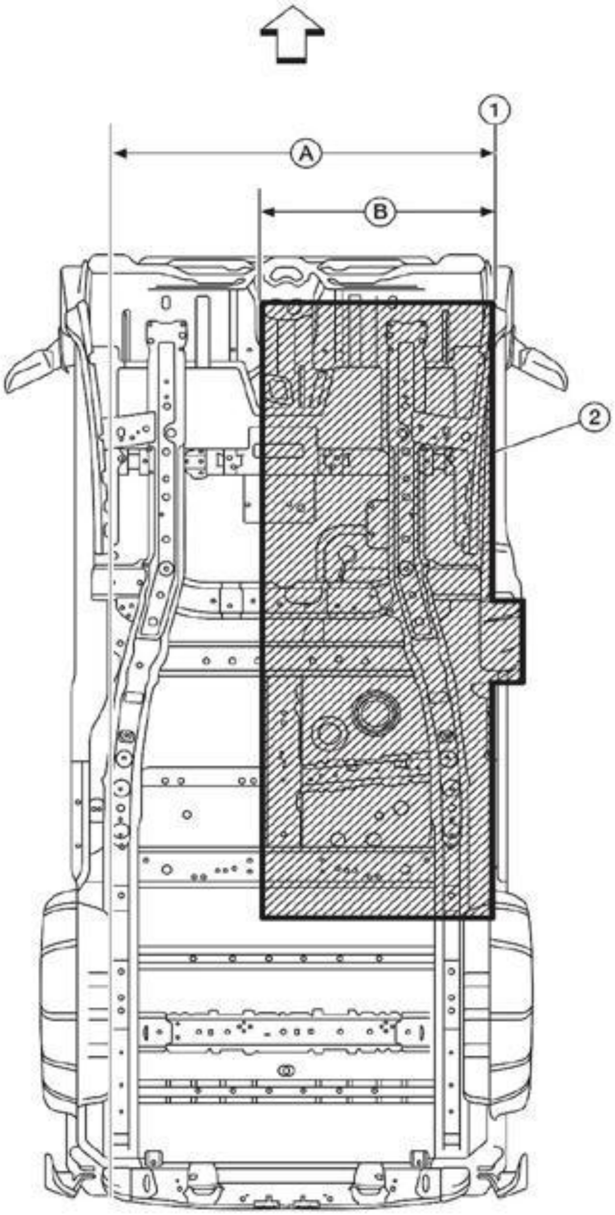
1. Fuel tank 2. Rear tank strap 3. Front tank strap 4. EVAP canister assembly
A. Fuel tank strap bolts

Drilling Precaution Area

CAUTION:

Use special care when drilling in the areas shown because the fuel tank, fuel pump, fuel filler hose, EVAP canister assembly, and EVAP hoses are located just below the floor and could be damaged.

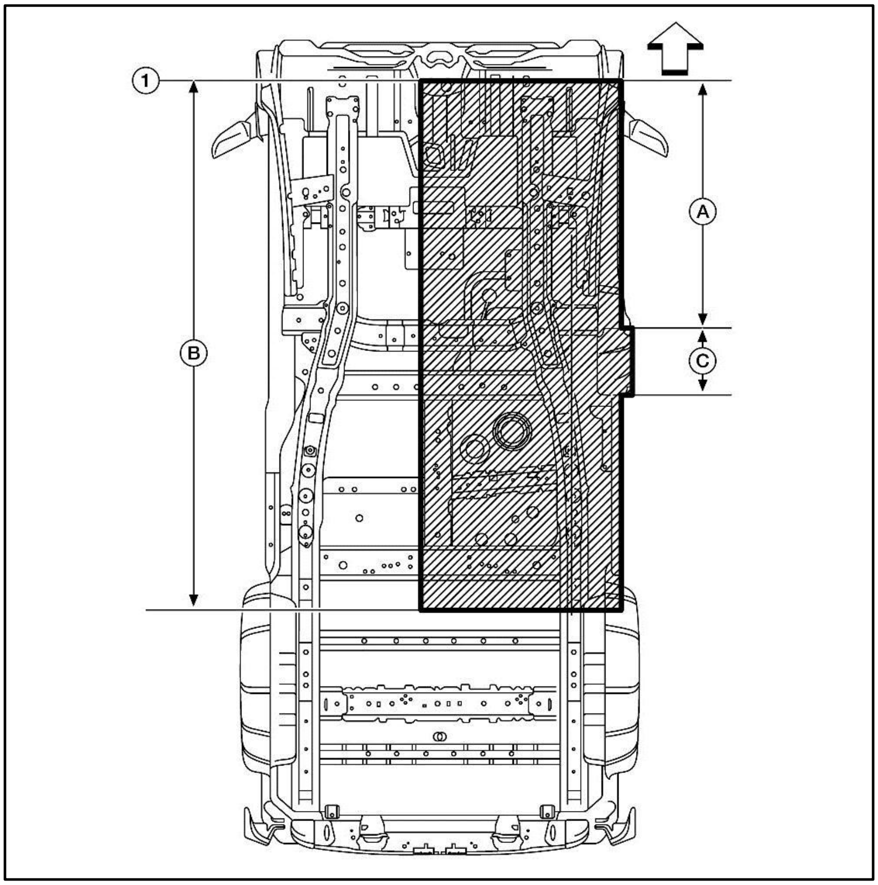
Fuel Tank — Floor Area



All dimensions and reference lines are shown with cargo mat removed.

1. Slide door weather strip pinch weld (reference line).
2. Fuel tank drill precaution zone

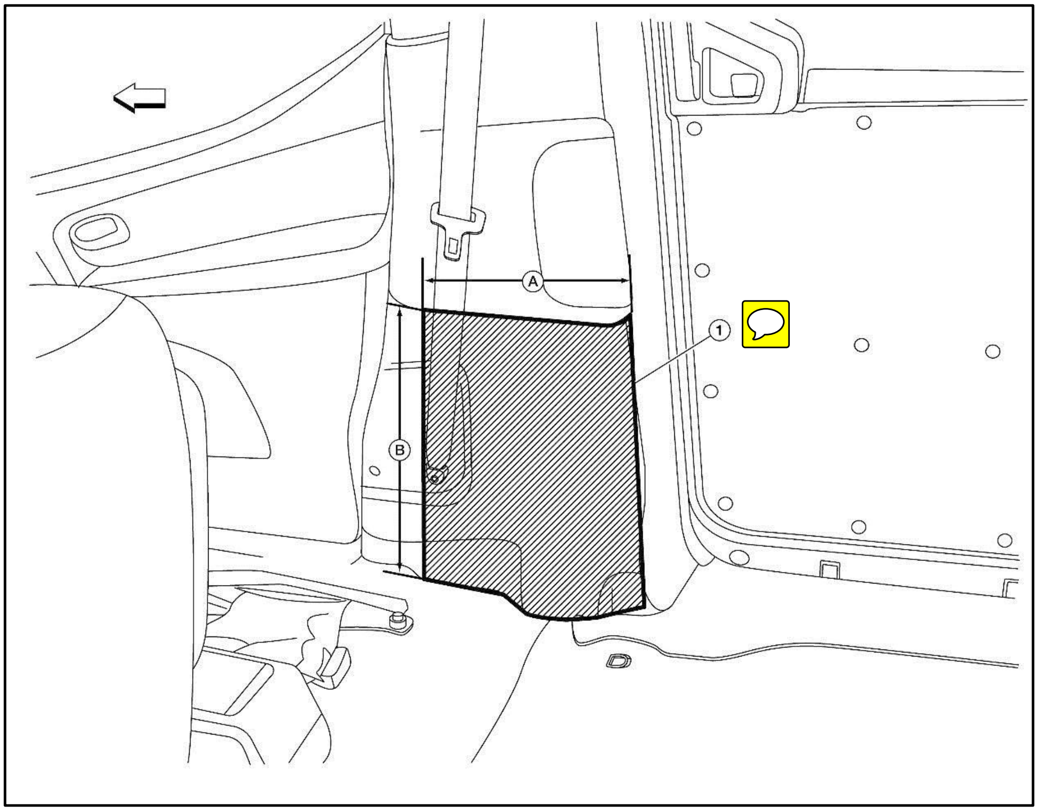
A. 1,366 mm (53.8 in).
B. 730 mm (28.7 in)



All dimensions and reference lines are shown with cargo mat removed.

1. Front door jamb front at floor (reference line).
2. Fuel tank drill precaution zone.
A. 920 mm (36.2 in).
B. 1,930 mm (76.0 in).
C. 210 mm (38.3 in)

Fuel Filler Neck — B-Pillar Area



Fuel Filler Area Drill Precautionary Zone

A. 300 mm (11.8 in)

B. 400 mm (15.7 in)

TRAILER TOW

Do not tow a trailer with this vehicle. This vehicle is not equipped with trailer tow equipment.

DESIGN REQUIREMENTS FOR MODIFICATIONS

COOLING

Engine Cooling System

CAUTION:

No modification to the engine cooling system (radiator, radiator shroud, cooling fans, liquid cooling circuit, etc.) is allowed. Sufficient air passage to the radiator must be maintained, therefore, do not block the air passage through the radiator grille to the radiator with publicity plates, posters, trim or other decorative elements. Reduced air flow can cause overheating and could lead to component damage.

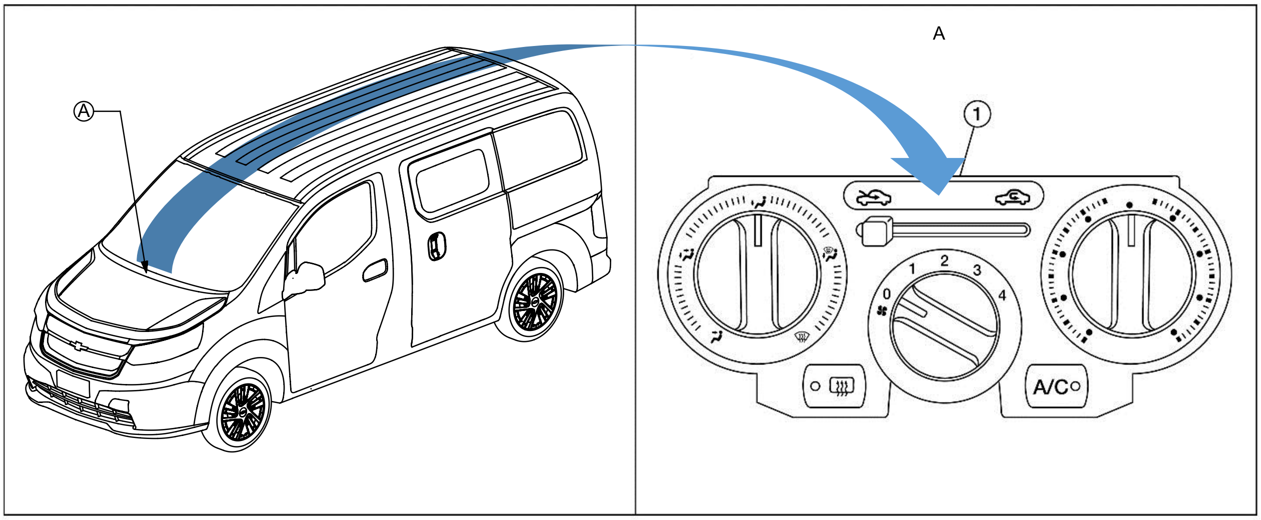
HVAC

Changesto The HVAC System

Changes to the HVAC system are not recommended. For liquid connection information, service data and specifications, refer to the service manual.

HVAC System Component Locations

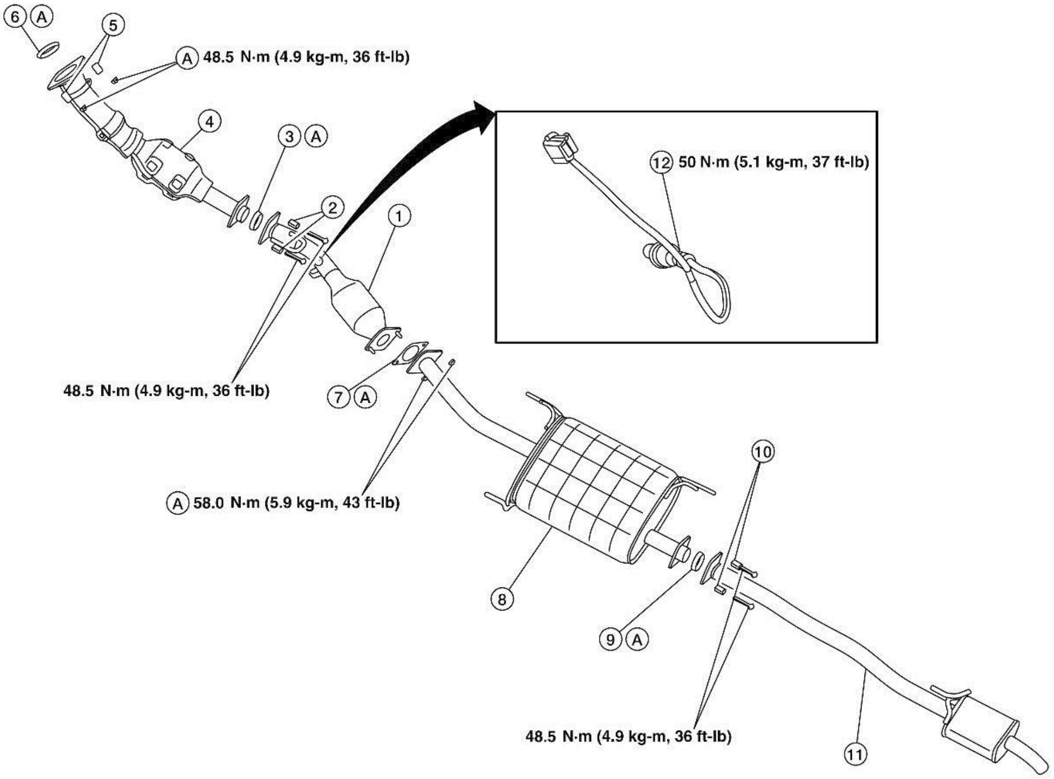
MANUAL AIR CONDITIONING SYSTEM



1. Front air control (shown with optional rear window defroster button).

Exhaust System

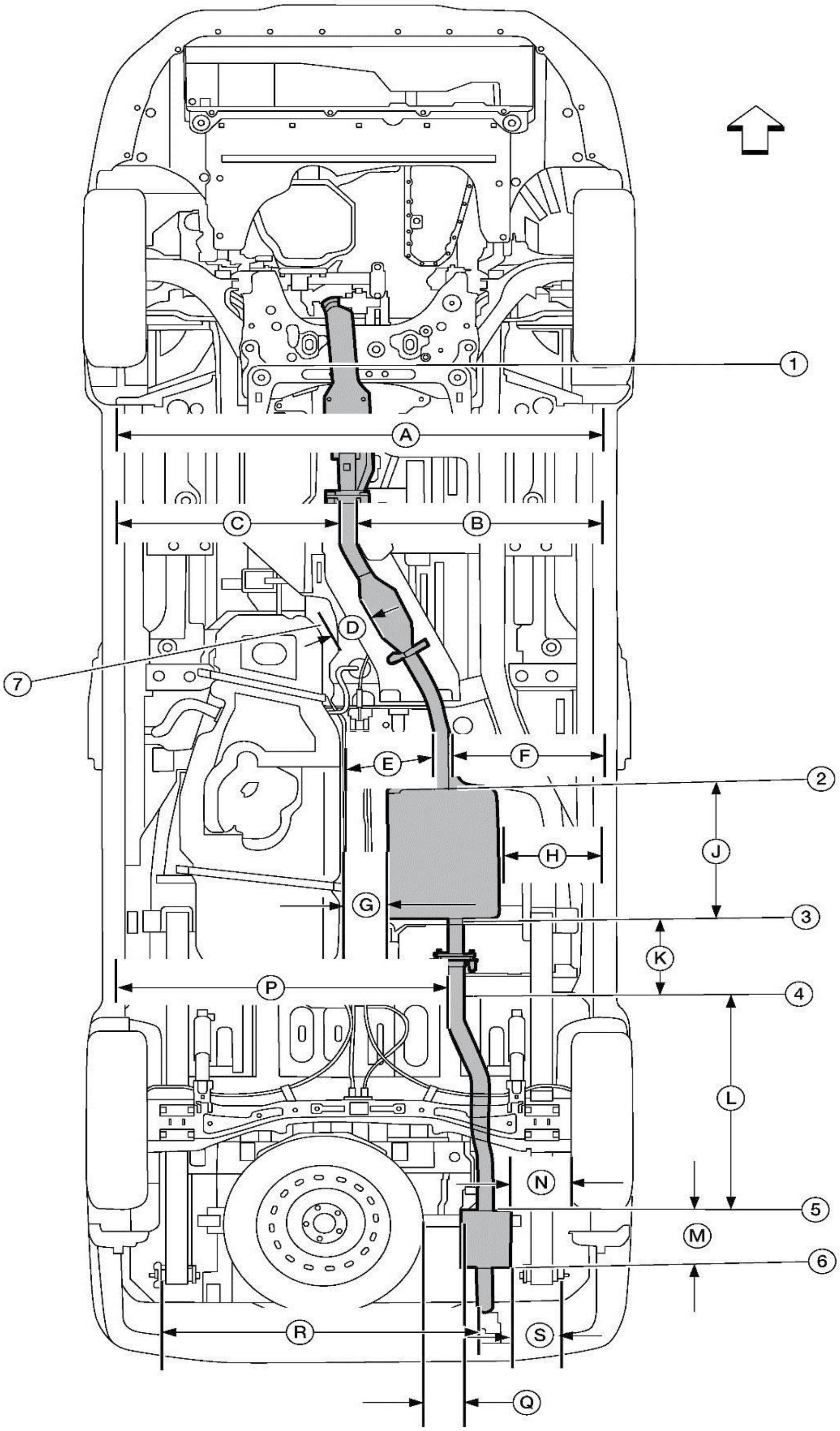
Changes to the exhaust system are not recommended.


6 A
5
A 48.5 N·m (4.9 kg-m, 36 ft-lb)
4
3 A
2
1
12 50 N·m (5.1 kg-m, 37 ft-lb)
48.5 N·m (4.9 kg-m, 36 ft-lb)
7 A
A 58.0 N·m (5.9 kg-m, 43 ft-lb)
10
8
9 A
48.5 N·m (4.9 kg-m, 36 ft-lb)
11

1. Intermediate exhaust tube 2. Exhaust bolt springs 3. Ring gasket 4. Front exhaust tube

5. Exhaust bolt springs 6. Ring gasket 7. Gasket 8. Main muffler 9. Ring gasket 10. Exhaust bolt springs 11. Tailpipe with secondary muffler 12. Heated oxygen sensor **A. Always replace after every disassembly**

Exhaust Measurements


1
A
C
B
D
7
E
F
2
H
J
G
3
K
P
4
L
N
5
M
6
R
S
Q

NOTE:

Shown as viewed from below.

Exhaust Measurements (continued)

1. Leading edge of bracket 2. Front edge of main muffler 3. Rear edge of main muffler
4. Rear edge of body channel 5. Front edge of secondary muffler 6. Rear edge of secondary
Muffler 7. Fuel tank heat shield

A. 1470 mm (57.9 in) B. 745 mm (29.3 in) C. 670 mm (26.4 in)
D. 120 mm (4.7 in) E. 265 mm (10.4 in) F. 460 mm (18.1 in)
G. 122 mm (4.8 in) H. 297 mm (11.7 in) J. 460 mm (18.1 in)
K. 240 mm (9.4 in) L. 730 mm (28.7 in) M. 200 mm (7.9 in)
N. 200 mm (7.9 in) P. 1002 mm (39.4 in) Q. 110 mm (4.3 in)
R. 993 mm (39.1 in) S. 64 mm (2.5 in)

CAUTION:

To prevent exhaust gas leaks and possible CO poisoning:

- **Always replace exhaust gaskets and ring gaskets with new ones when reassembling.**

- **Temporarily tighten the nuts on the front and rear of the exhaust tubes. Check each part for interference with other components, and then tighten the nuts and bolts to specification.**

Inspection after Installation

- Check exhaust tube joints for exhaust gas leaks and unusual noises with the engine running.
- Check to ensure that mounting brackets and rubber insulators are installed properly and free from undue stress.
- Improper installation could result in excessive noise and vibration.

WHEEL AND TIRE

General

- The replacement of the tires with those other than the ones indicated by The OEM is not recommended.
- Using Tires of different make, size, type or characteristics on the same axle is not allowed.
- Using non-recommended tires could affect the performance of the Vehicle Dynamic Control (VDC) system and/or other vehicle components.
- The City Express Cargo vehicle is designed to use commercial (C) rated tires only. Do not use passenger rated tires.

STEERING AND SUSPENSION

Vehicle Handling Information

WARNING:

• Changes made to the vehicle that significantly affect the ride height may cause vehicle control problems during sharp turns or sudden steering maneuvers. Any maneuvers of this type could result in an accident. The steering gear, intermediate shaft, coupling shaft, linkage, column, and steering wheel should not be altered or relocated. Steering linkage travel should not be restricted.

CAUTION:

• Because the heat from welding on or near the suspension or steering components may damage or weaken the components, it is not authorized.

• Welding equipment should not be grounded to any of the suspension components.

• Any new components attached to the steering column or its components must not interfere with the steering column performance during either normal operation or crash situations.

• New components and/or the vehicle load must not exceed the front and rear GAWRs or the GVWR.

NOTE:

The aftermarket equipment manufacturer, second stage manufacturer, and upfitter are responsible for maintaining or restoring the front wheel alignment after modifications to the vehicle are complete. The straight ahead orientation of the steering wheel must be maintained when re-adjusting the front wheel alignment. Changes to the vehicle center of gravity will affect handling. The upfitter is responsible for maintaining compliance with the Federal or Canada Motor Vehicle Safety Standards in regards to the center of gravity and vehicle handling characteristics.

DRIVELINE

CAUTION:

Any deviation from OEM specifications may adversely affect powertrain operation, including engine, transmission, or component reliability. The aftermarket equipment manufacturer, second stage manufacturer, and upfitter are responsible for maintaining the specifications after the completion of any modifications.

TRANSMISSION

CAUTION:

- **The engine and transmission position relative to the shift linkage must not be altered.**
- **The transmission vent must not be altered, pinched, collapsed, restricted or relocated.**
- **The spacing for tool access for transmission adjustments or removal must be maintained.**
- **Transmission oil cooler lines should not be kinked, bent, or restricted. All oil cooler lines must be properly retained with adequate clips.**
- **The shift cable, external transmission shift lever, and shift cable bracket must not be altered.**
- **Transmission identification tags must not be removed or destroyed.**
- **All transmission wire harness routing, locating clips, heat shielding, and clearance to the exhaust must be maintained as installed by the factory**

UNIBODY AND FRAME

WARNING:

Failure to follow the recommendations below may weaken the vehicle structure, which could result in death or serious injury.

- **Do not modify or alter the front crush horns. Modifications or alterations could adversely affect the vehicle in a crash.**

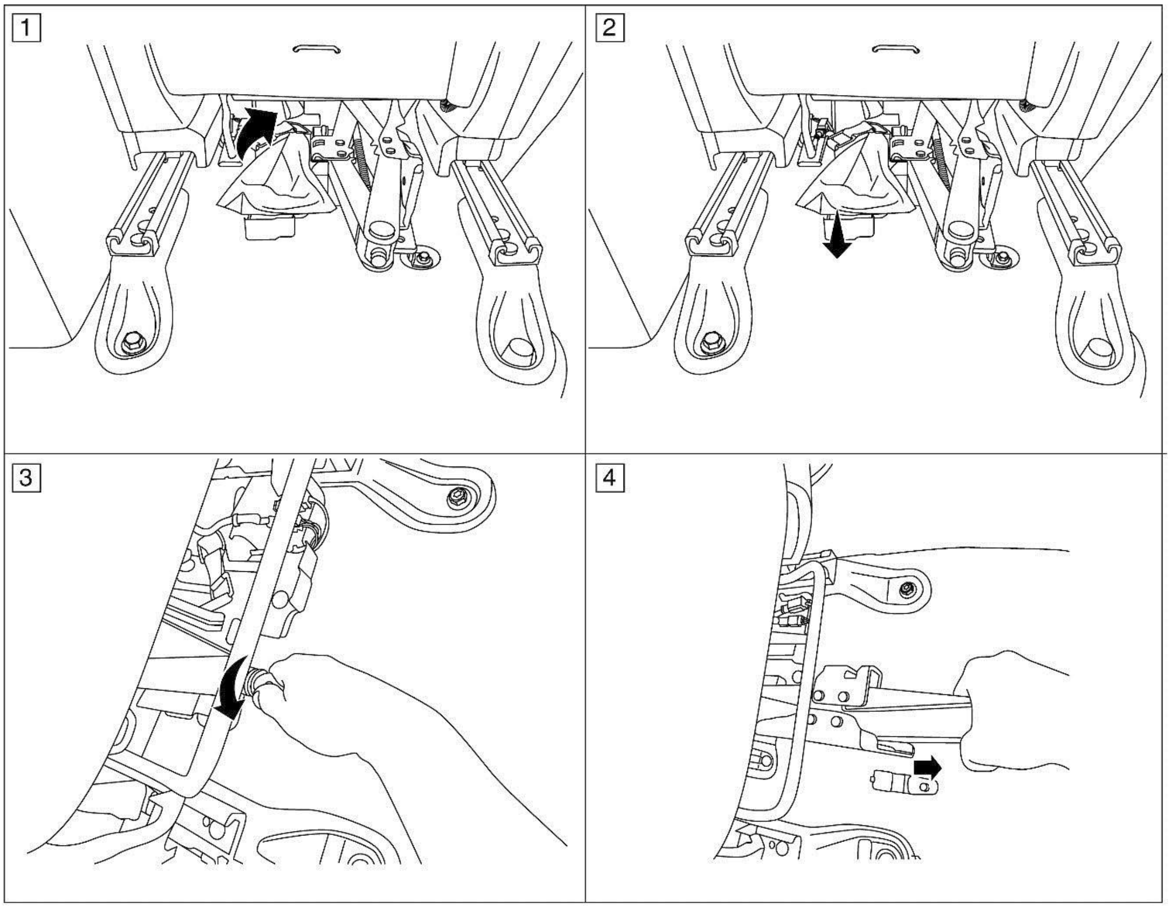
The vehicle structure is a unibody design with high strength steel support areas. High strength steel locations are not intended for modification. Refer to HIGH STRENGTH STEEL LOCATIONS (TBD) in this section.

JACK

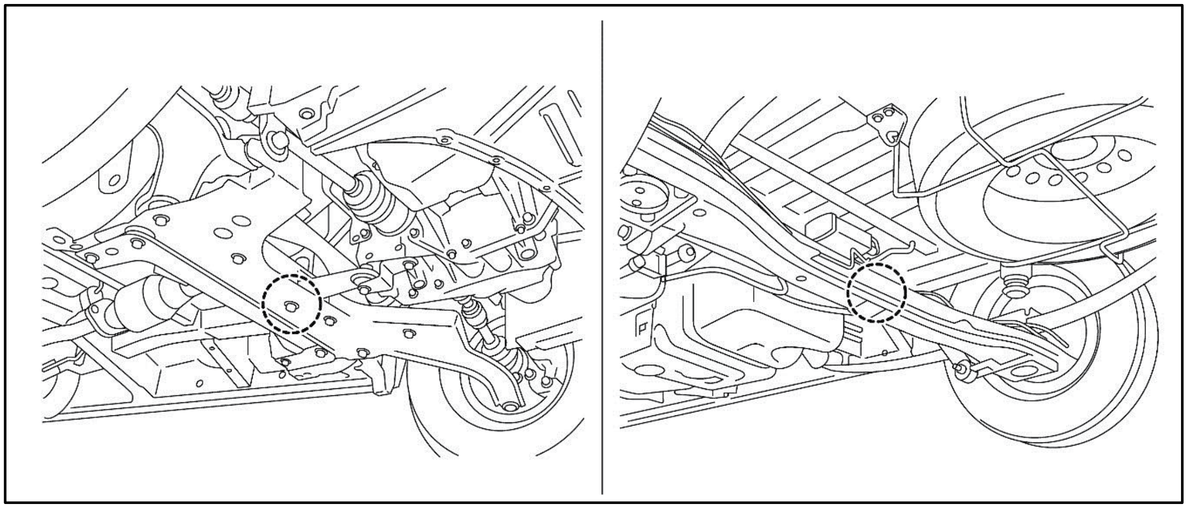
Jacking and Lifting Points

Jack Storage

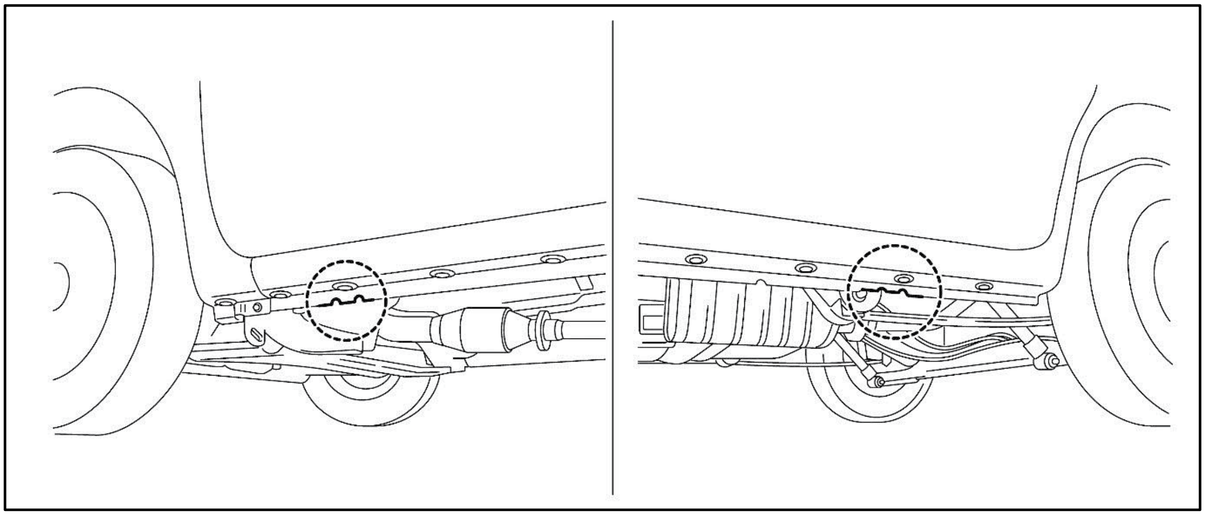
NOTE: Jack and tools are stored under front passenger seat.



Garage Jack Points



2 Pole Lift Points



HIGH STRENGTH STEEL LOCATIONS

Precaution in Repairing High Strength Steel (HSS)

WARNING:

- **While working, suitable work clothes, a work cap and safety shoes must be worn. To prevent burns, a long sleeve shirt and trousers must also be worn and must not be taken off under any circumstance.**
- **Before starting repair work, be sure to disconnect the negative terminal of the battery.**
- **Pay attention to ventilation and health of the operators.**
- **Paint and sealants may generate poisonous gases when heated by fire.**

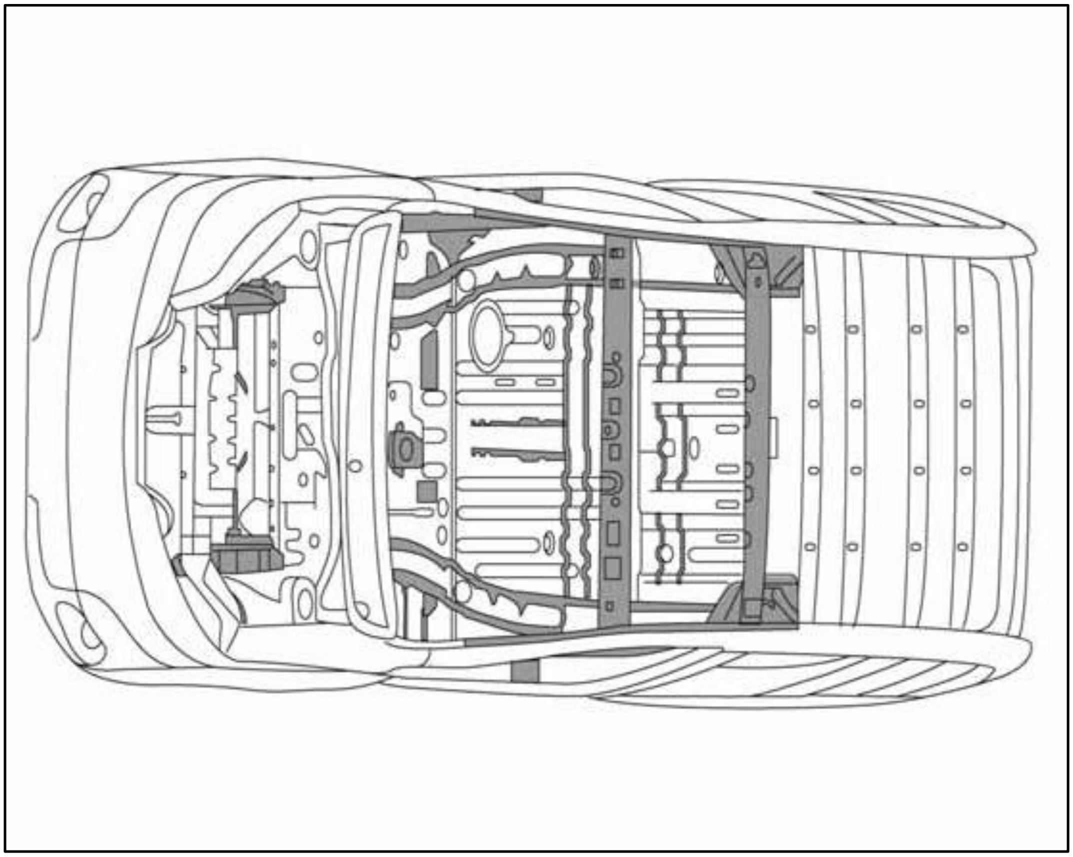
WARNING:

Do not heat, bend, or cut high strength steel or the structural integrity of the vehicle may be compromised.

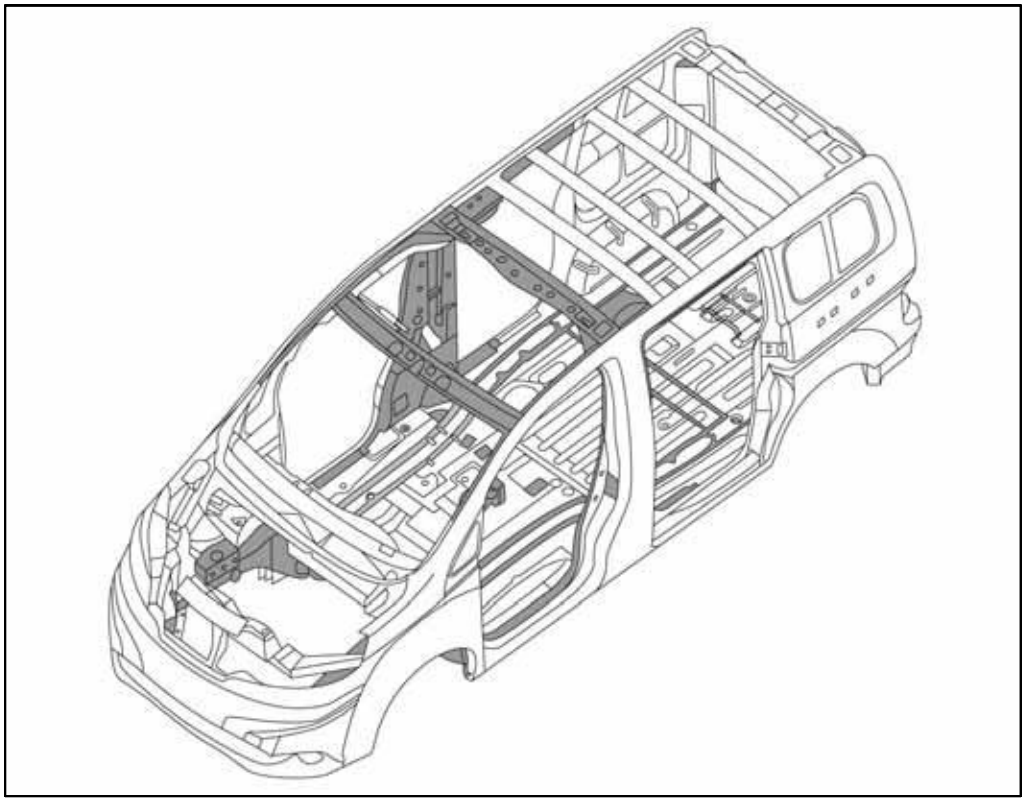
High Strength Steel Locations

The grey shading in the following illustrations indicate body areas with high strength steel (HSS).

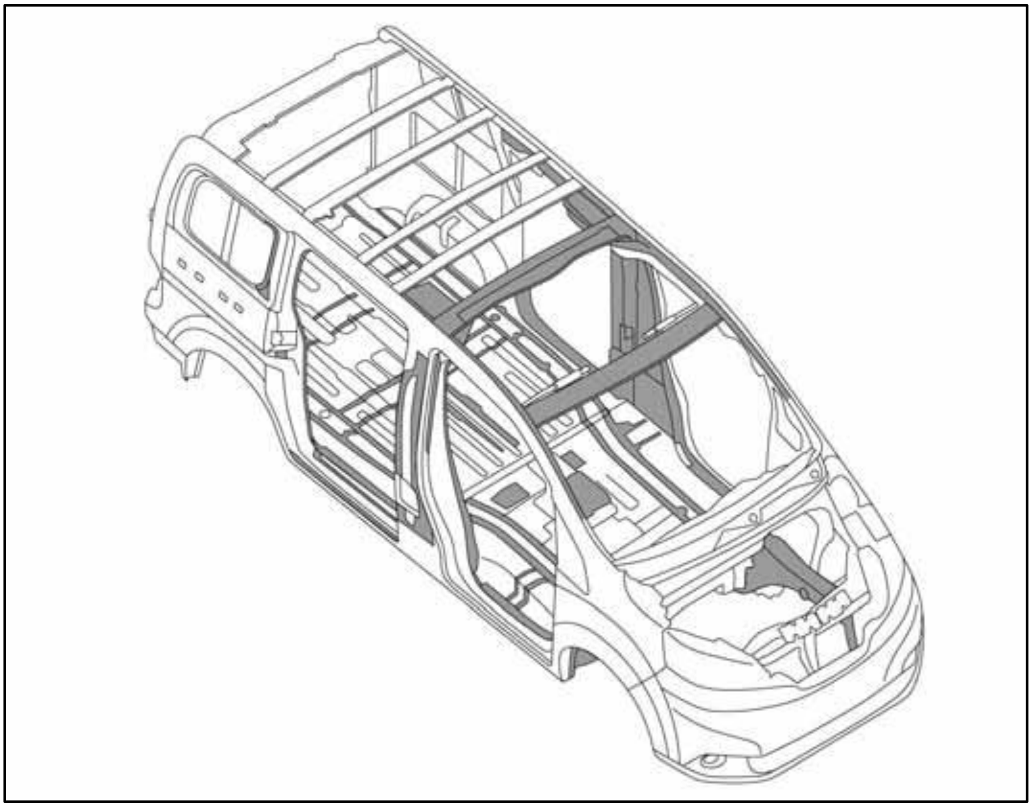
Front of Vehicle



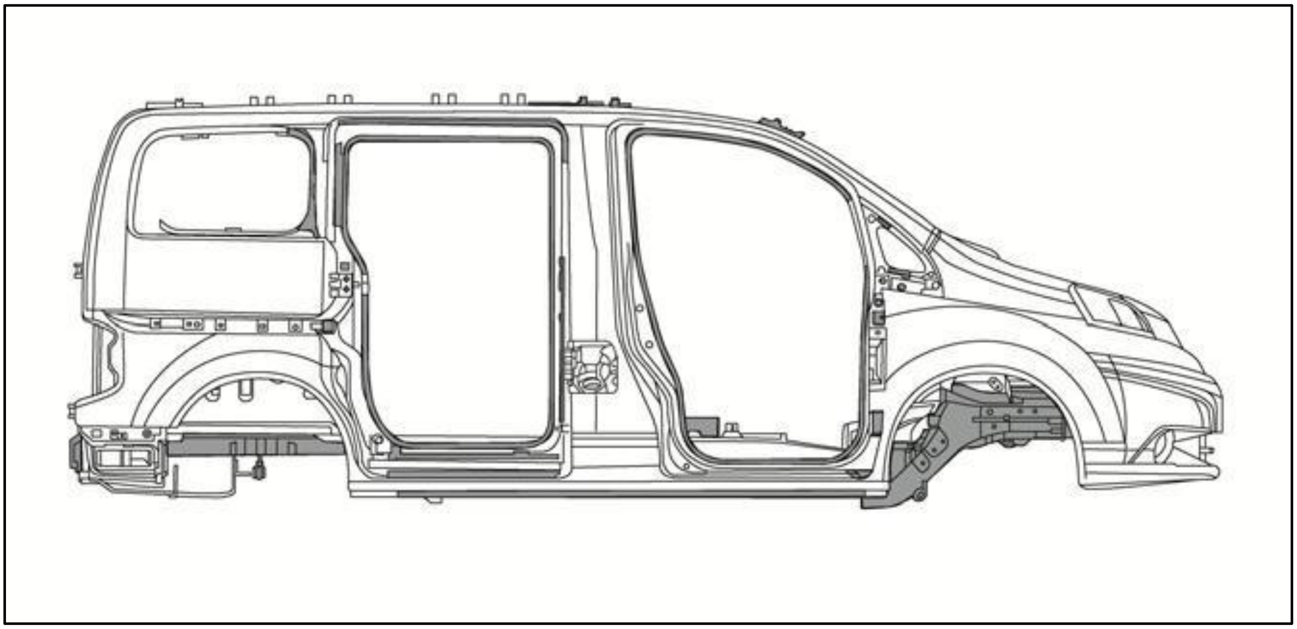
Front Left Side of Vehicle



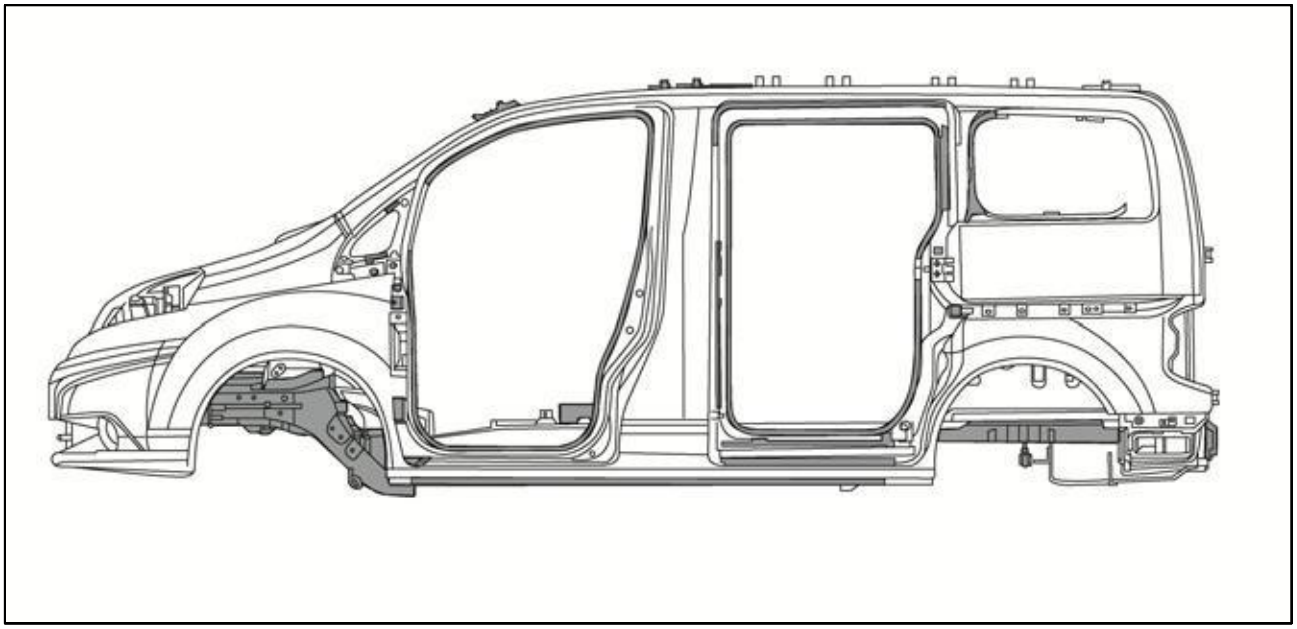
Front Right Side of Vehicle



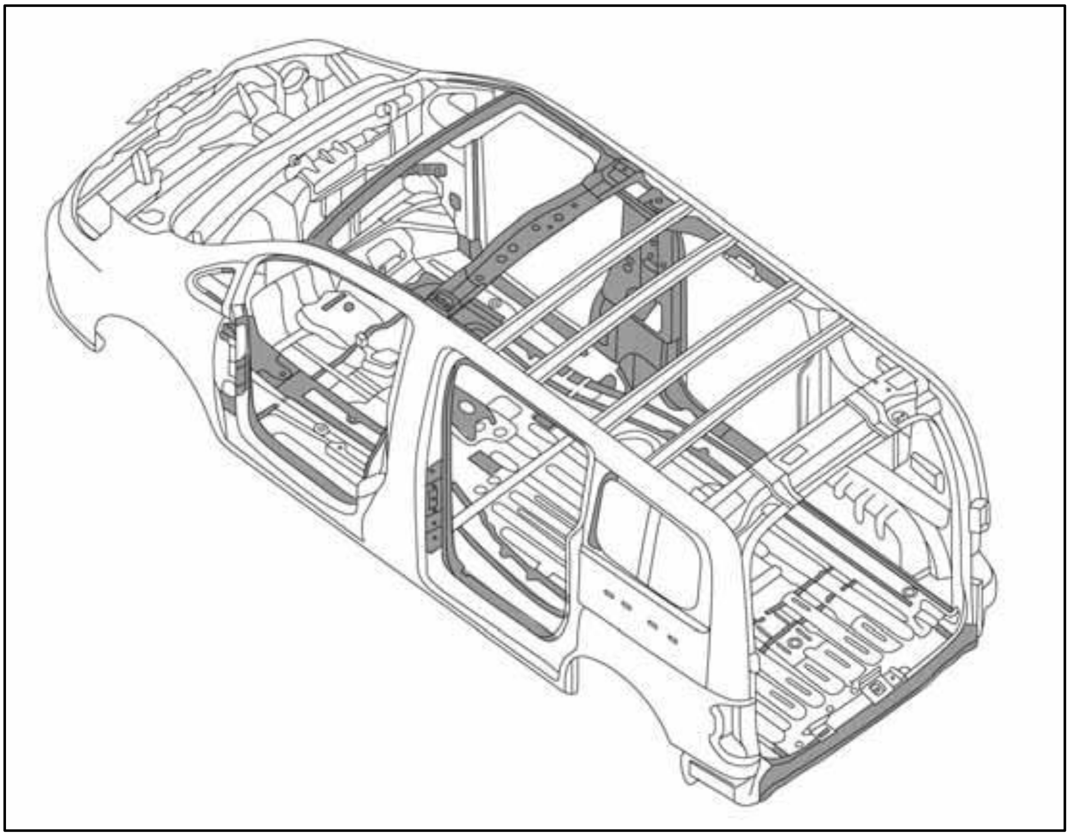
Right Side of Vehicle



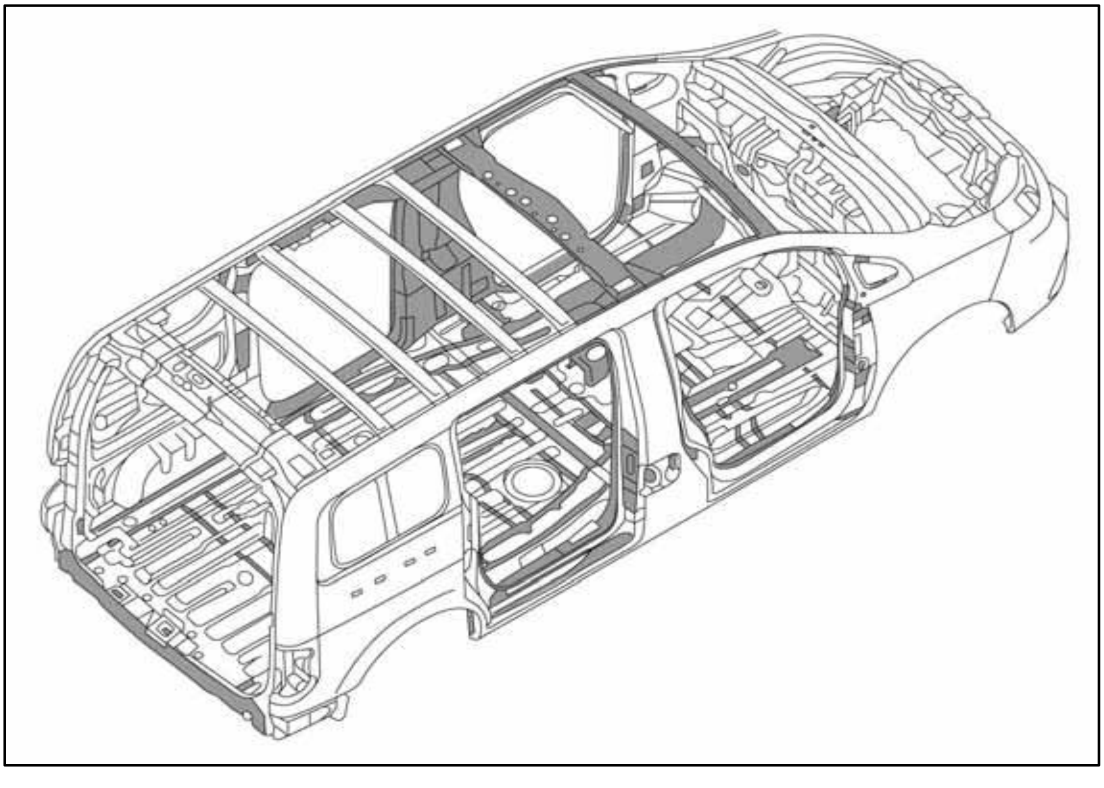
Left Side of Vehicle



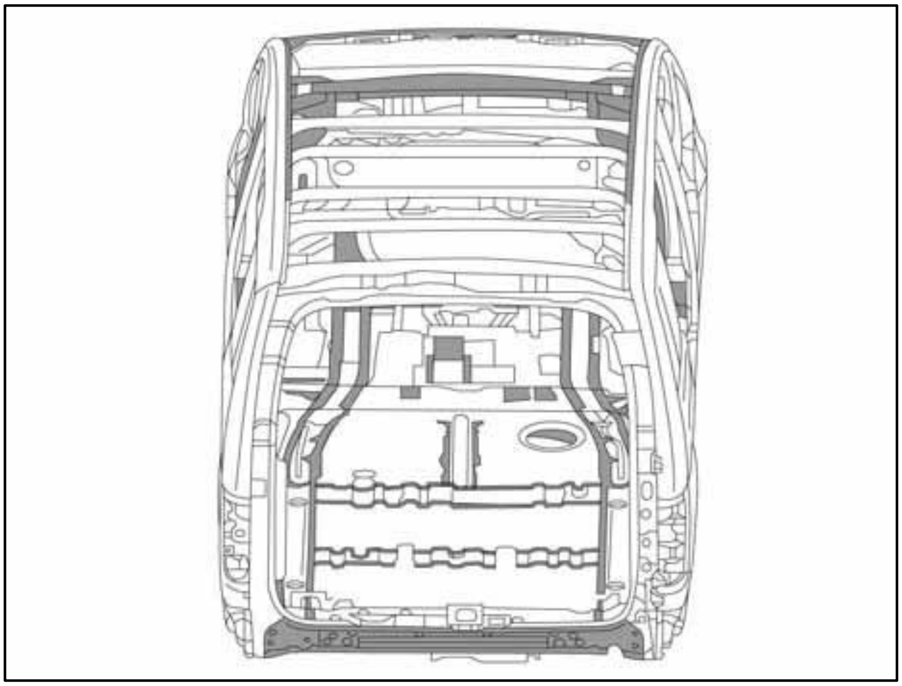
Rear Left Side of Vehicle



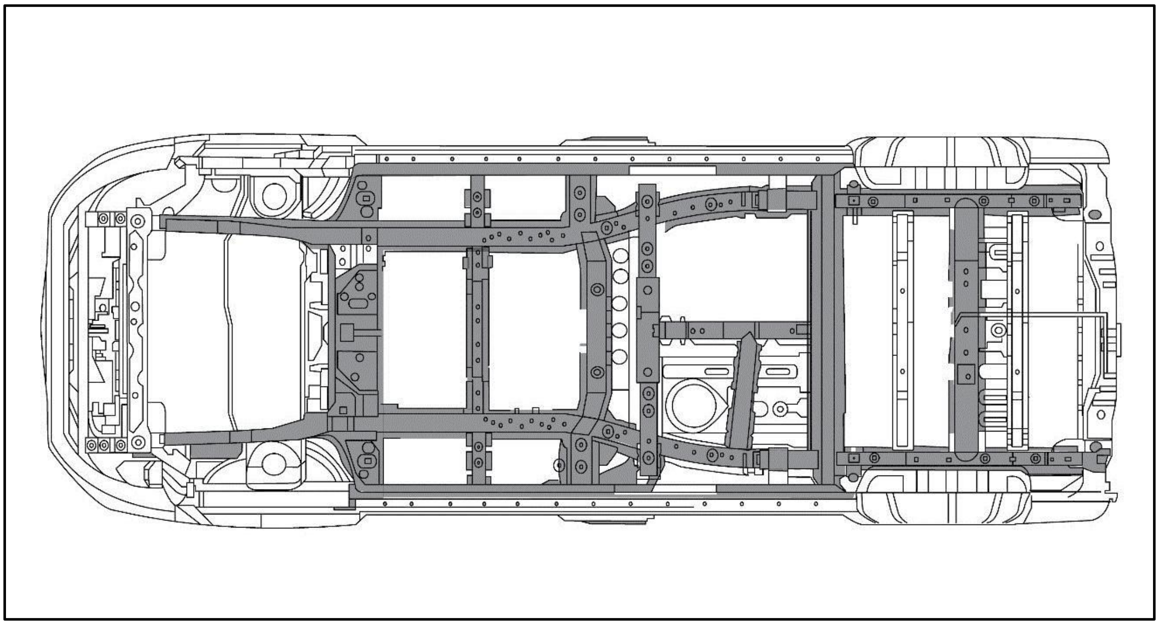
Rear Right Side of Vehicle



Rear of Vehicle



Floor



WELDING

WARNING:

Do not heat, bend, or cut high strength steel or the structural integrity of the vehicle may be compromised. HSS is used for body panels in order to reduce vehicle weight. Accordingly, precautions in repairing automotive bodies made of HSS are described below:

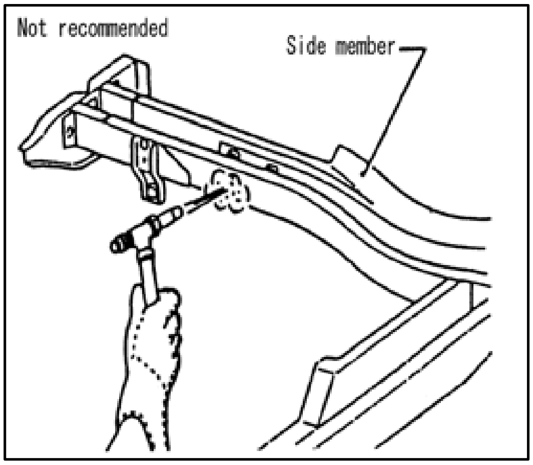
HSS Used in City Express Vehicles

Tensile strength	**Major applicable parts**
440 - 780 MPa	• Front inner pillar upper • Front pillar hinge brace • Outer front pillar reinforcement • Other reinforcements
980 - 1310 MPa	• Outer sill reinforcement • Main back pillar

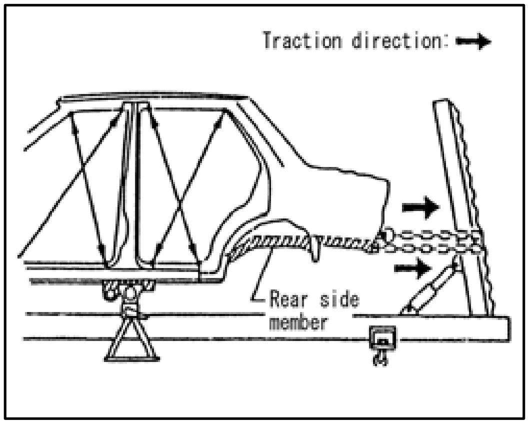
Read the following precautions when repairing HSS:

1. Additional points to consider:

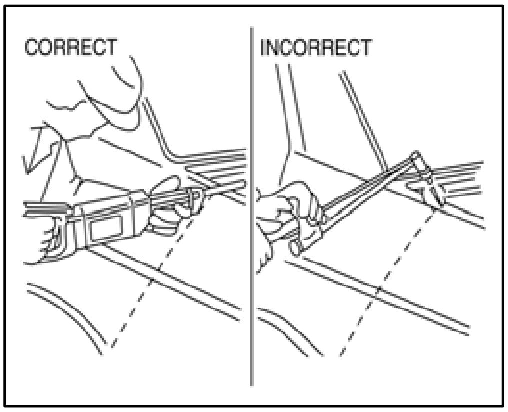
- The repair of reinforcements (such as side members) by heating is not recommended since it may weaken the component. When heating is unavoidable, do not heat HSS parts above 550° C (1,022° F). Verify heating temperature with a thermometer (Crayon-type and other similar type thermometers are appropriate).



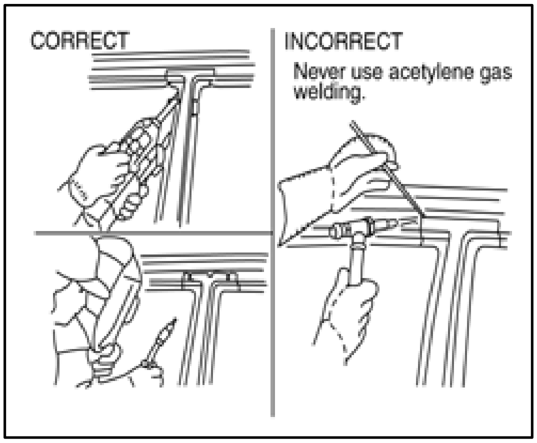
- When straightening body panels, use caution in pulling any HSS panel. Because HSS is very strong, pulling may cause deformation in adjacent portions of the body. In this case, increase the number of measuring points and carefully pull the HSS panel.



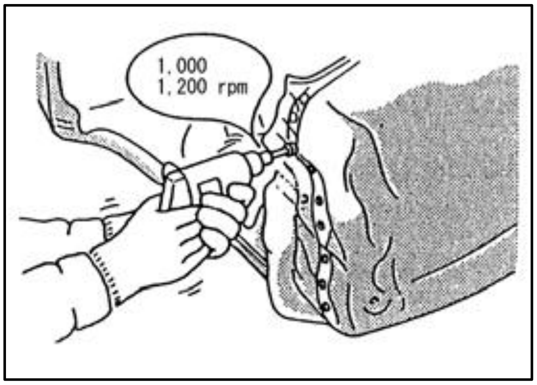
When cutting HSS panels, avoid gas (torch) cutting if possible. Instead, use a saw to avoid weakening surrounding areas due to heat. If gas (torch) cutting is unavoidable, allow a minimum margin of 50 mm (1.97 in).



- When welding HSS panels, use spot welding whenever possible in order to minimize weakening surrounding areas due to heat. If spot welding is impossible, use MIG welding. Do not use gas (torch) welding because it is inferior in welding strength

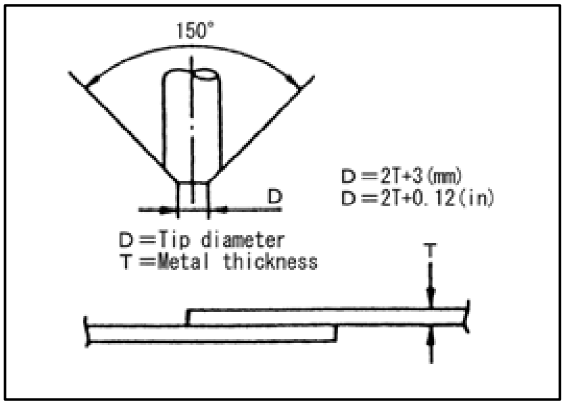

CORRECT
INCORRECT
Never use acetylene gas welding.

- The spot weld on HSS panels is harder than that of an ordinary steel panel. Therefore, when cutting spot welds on a HSS panel, use a low speed high torque drill (1,000 to 1,200 rpm) to increase drill bit durability and facilitate the operation.



- SP150 HSS panels with a tensile strength of 785 to 981 N/mm2 (80 to 100 kg/mm2, 114 to 142 lb/sq in), used as reinforcement in the door guard beams, is too strong to repair. When these HSS parts are damaged, the outer panels also sustain substantial damage; therefore, the assembly parts must be replaced.

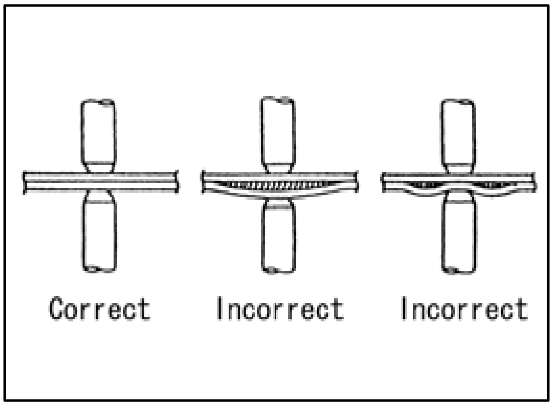
Precautions in spot welding HSS: This work should be performed under standard working conditions.


150°
D
D=2T+3 (mm)
D=2T+0. 12 (in)
D=Tip diameter
T=Metal thickness
T

Always note the following when spot welding HSS:

- The electrode tip diameter must be sized properly according to the metal thickness.

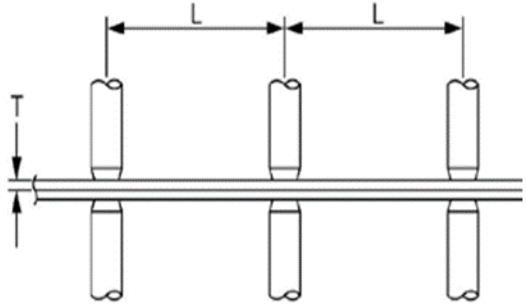
- The panel surfaces must fit flush to each other, leaving no gaps.


Correct
Incorrect
Incorrect

- Follow the specifications for the proper welding pitch

NOTE:

The minimum welding pitch varies with the thickness of panels to be welded. In general, observe the values in the following table. Note that excessively small pitch allows the current to flow through surrounding portions, resulting in poor welding strength.

Thickness (T) mm (in)	Minimum pitch (L) mm (in)	
0.6 (0.024)	10 (0.39) or over	
0.8 (0.031)	12 (0.47) or over	
1.0 (0.039)	18 (0.71) or over	
1.2 (0.047)	20 (0.79) or over	
1.6 (0.063)	27 (1.06) or over	
1.8 (0.071)	31 (1.22) or over	

VEHICLE INTERIOR

Modifications in the Vehicle Interior

General

- The modifications should not affect the operation of the control units (pedals, switches, rods, etc.) located in the area affected by the modification.
- After any modification to the body that affect the acoustic and thermal insulation, the new and/or modified insulation must meet or exceed the original specifications.
- The ergonomic access to the controls for the driver must not be prevented by the installation of new components.
- Any modifications made by the aftermarket equipment manufacturer, second stage manufacturer, and upfitter must be properly sealed to protect against corrosion.
- The aftermarket equipment manufacturer, second stage manufacturer, and upfitter must ensure that any modifications that have been made to the cabin still meet the legal requirements regarding the interior and exterior characteristics.
- No new holes should be drilled to allow for attaching any new components to the roof of the cabin.

Modifications in the Roof of the Cabin

- When attaching equipment to the roof, make sure that the added weight does not exceed the maximum roof load limit.
- All components that pass through the external sheet metal (for electric cables, telephone aerials, etc.) must be properly sealed.
- Changes to the center of gravity should not exceed the maximum authorized height.

PAINT WORK

The aftermarket equipment manufacturer, second stage manufacturer, and upfitter are responsible for repairing any damage to the paint incurred while modifying the vehicle.

Only OEM specified paint should be used for these repairs. Refer to the BRM section in the Service Manual for information about the paint.

Component	**Color code**	B23	K23	QM1	KH3	NAC
	Description	Blue	Silver	White	Black	Red
	Type	M	M	LS	LS	LS
	Clear Coat	N	N	N	N	N
Outside Mirror	LS	Molded Black				
	LT	Body Color				
Bumpers	LS	Black				
	LT	Body Color*				
Outside Door Handle	LS	Molded Black				
	LT	Body Color*				
Radiator Grill	LS	Grey Paint				
	LT	Chromium Plate*				

M: Metallic; LS-Solid; n: Non-primer less Clear Coat; *: Option

ADHESIVE INFORMATION

MSDS Information

Product Name Code	Number Supplier	Emergency Phone Numbers
Sunnex (adhesive for body)	SH-310	Sunstar Inc. www.sunstarea.com 937-746-8575
Terostat (mastic adhesives)	06-1273 HM SA 461 SA 462 SA 463	Henkel Corporation www.henkel.com USA 1-248-583-9300 Chemtrec emergency 1-800-424-9300
Mastic Adhesive	PCC-13A	EFTEC North America, L.L.C. www.eftec.com 24 hour emergency 1-888-853-1758 Emergency transport 1-800-424-9300
Stiffener for Outer Panels	PE7000	NITTO Denko www.nitto.com 81-6-6452-2101
Betaseal Adhesive(direct glassing)	57302	Dow Chemical Co. www.dow.com 24 hour emergency 1-989-636-4400 Customer Information 1-800-258-2436

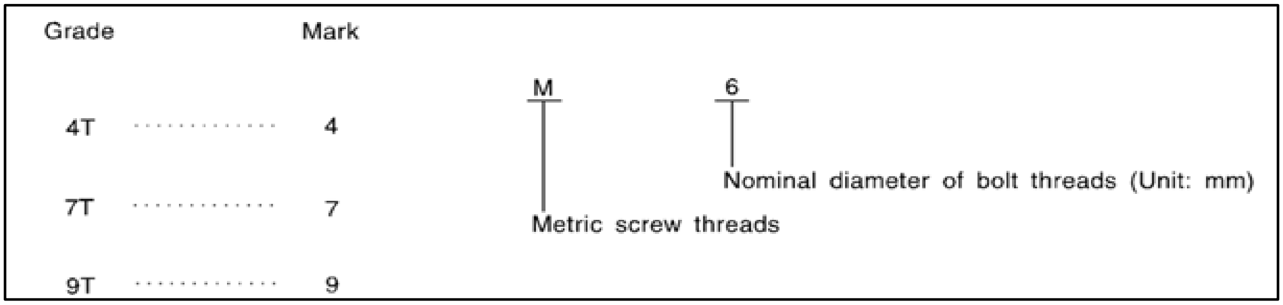
REPLACING BOLTS

Tightening Torque Table

Grade	Bolt Size	Bolt Diameter* (mm)	Pitch (mm)	Tightening torque (Without lubricant)							
				Hexagon Head Bolt				Hexagon flange bolt			
				Nm	Kg-m	Ft-lb	In-lb	Nm	Kg-m	Ft-lb	In-lb
4T	M6	6.0	1.00	5.5	0.56	4	49	70	.71	5	62
	M8	8.0	1.25	13.5	1.4	10	---	17	1.7	13	---
			1.00	13.5	1.4	10	---	17	1.7	13	---
	M10	10.0	1.50	28	2.9	21	---	35	3.6	26	---
			1.25	28	2.9	21	---	35	3.6	26	---
	M12	12.0	1.75	45	4.6	33	---	55	5.6	41	---
			1.50	45	4.6	33	---	65	6.6	48	---
	M14	14.0	1.50	80	8.2	59	---	1000	10	74	---
7T	M6	6.0	1.00	9	0.92	7	80	11	1.1	8	97
	M8	8.0	1.25	22	2.2	16	---	28	2.9	21	---
			1.00	22	2,2	16	---	28	2.9	21	---
	M10	10.0	1.50	45	4.6	33	---	55	5.6	41	---
			1.25	45	4.6	33	---	55	5.6	41	---
	M12	12.0	1.75	80	8.2	59	---	100	10	74	---
			1.50	80	8.2	59	---	100	10	74	---
	M14	14.0	1.50	130	13	96	---	177	17	125	---
9T	M6	6.0	1.00	11	1.1	8	---	13.5	1.4	10	---
	M8	8.0	1.25	28	2.9	21	---	35	3.6	26	---
			1.00	28	2.9	21	---	35	3.6	26	---
	M10	10.0	1.50	55	5.6	41	---	80	8.2	59	---
			1.25	55	5.6	41	---	80	8.2	59	---
	M12	12.0	1.75	100	10	74	---	130	13	96	---
			1.50	100	10	74	---	130	13	96	---
	M14	14.0	1.50	170	17	125	---	210	21	155	---

*Nominal diameter

1. Special parts are excluded.
2. This standard is applicable to bolts having the following marks embossed on the bolt head.



Grade	Mark
4T	4
7T	7
9T	9

ADD ON EQUIPMENT

ANTI-CORROSION PROTECTION

CAUTION:

Failure to refinish bare metal will result in corrosion.

The basic steps to refinish bare metal are as follows:

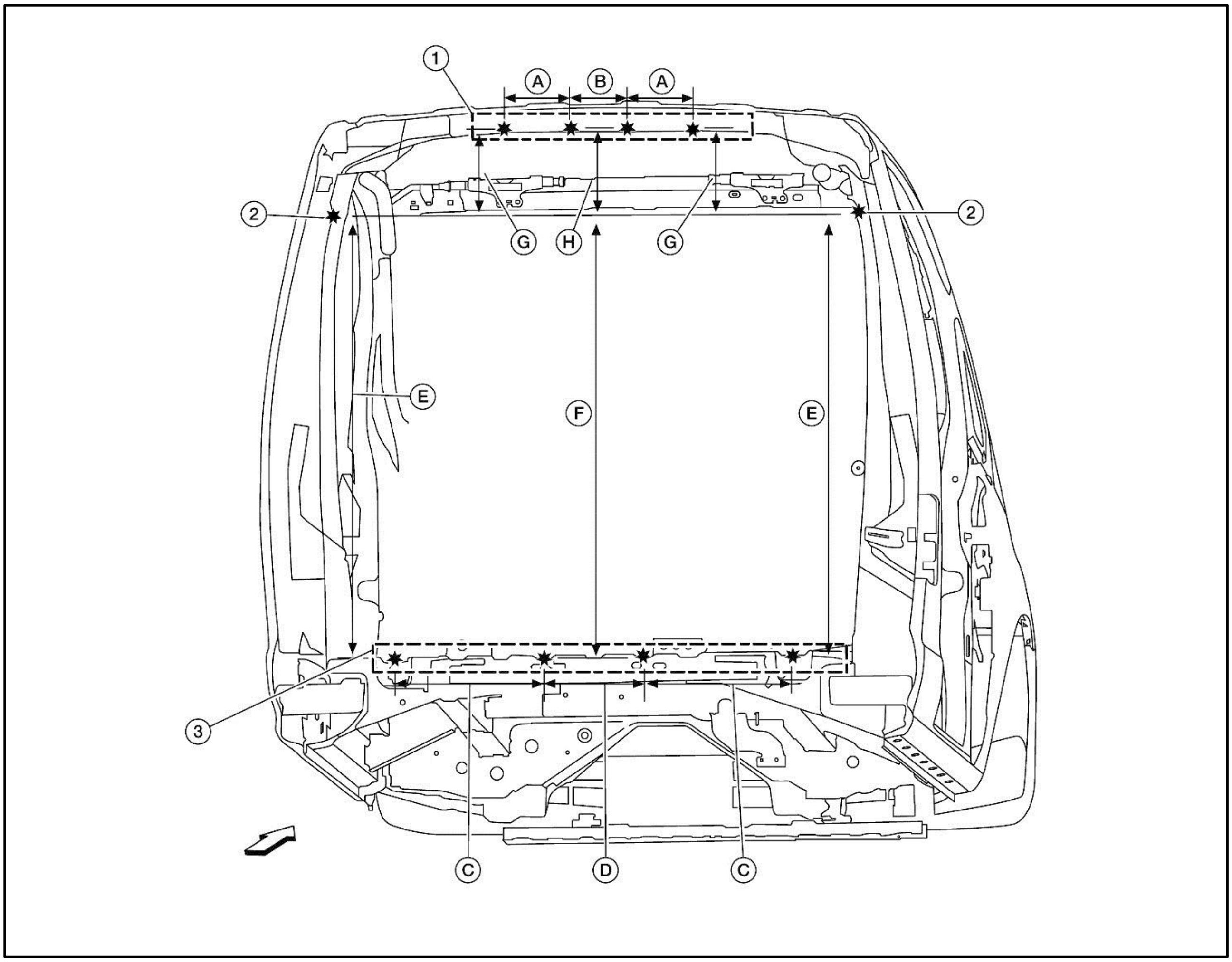
1. Prep the metal surface(s) as follows:
    - A. Remove burrs from the edges with a file or sandpaper.
    - B. Thoroughly clean the metal with solvent and allow to completely dry.
    - C. Apply self-etching primer to all bare metal.
    - D. Allow primer to properly dry.
2. Apply base coat paint and allow to properly dry.
3. Apply clear coat and allow to properly dry.
4. Apply OEM approved Wax available at Chevrolet dealers.

SHELVING AND BULKHEAD INSTALLATION

Bulkhead

The bulkhead should be attached to the OEM supplied weld nuts in the roof cross member and the floor. No new attachment points should be added. Loading should be distributed evenly utilizing as many mounting points as possible.

Before bulkhead installation, it is necessary to cut away the rear portion of the headlining to avoid interference with the side curtain air bags deployment zones. The headlining should not be trapped, pinched or glued to the bulkhead.



* Weld nut locations for bulkhead installation; All bolts are M8 x 1.25

1. Mounting point loading not to exceed 10 kg (22 lbs) per point. Total loading across these 4 mounting points not to exceed 40 kg (88 lbs).
2. Mounting point loading not to exceed 10 kg (22 lbs) per point. Points may be plugged with M8 bolts.
3. Mounting point loading not to exceed 10 kg (22 lbs) per point. Total loading across these 4 mounting points not to exceed 40 kg (88 lbs)

.

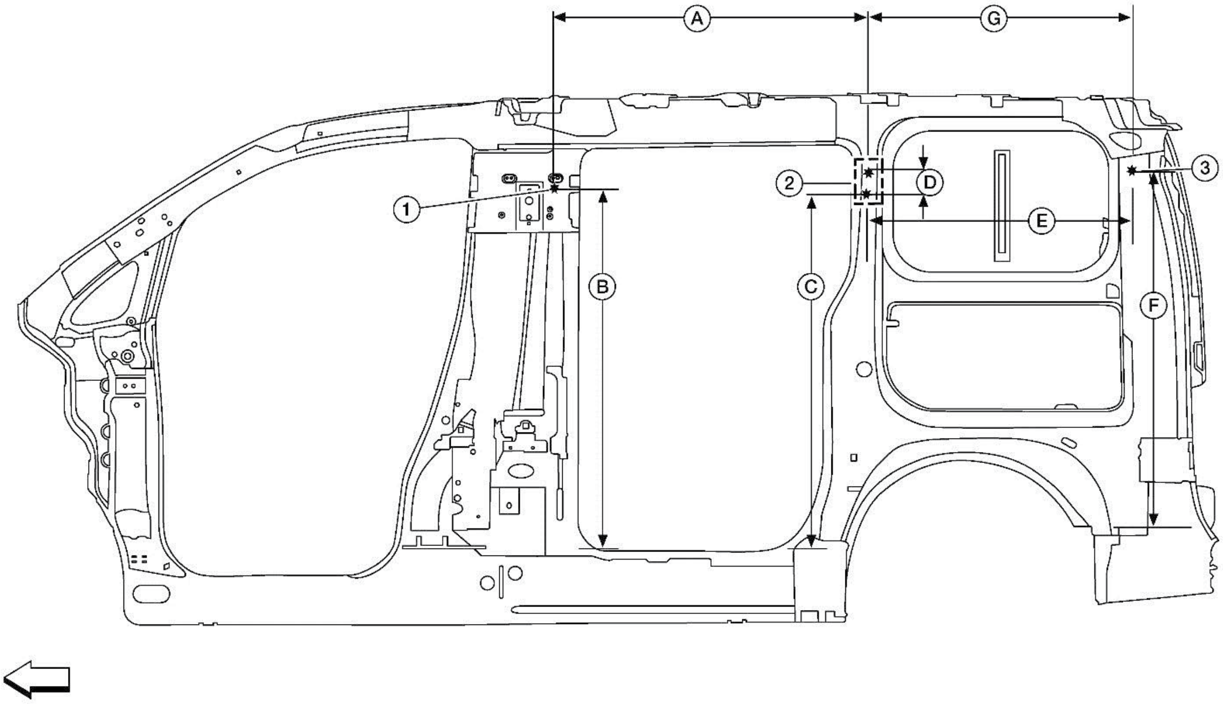
A. 165 mm (6.5 in) B. 138 mm (5.4 in) C. 375 mm (14.8 in)

D. 255 mm (10.0 in) E. 1,125 mm (44.3 in) F. 1,135 mm (44.7 in)

G. 173 mm (6.8 in) H. 193 mm (7.6 in)

RH Body Side and D-pillar Inner

RH body side inner as viewed from inside the vehicle. Loading should be distributed evenly, utilizing as many mounting points as possible.



Weld nut locations; All bolts are M8 x 1.25.

1. Bulkhead mounting weld nut

 (Mounting point loading not to exceed 10 kg (22 lbs.). Point may be plugged with M8 bolt.)

2. Mounting point loading not to exceed 10 kg (22 lbs.) per point.

(Maximum loading across these 2 mounting points not to exceed 20 kg (44 lbs.)).

3. Mounting point loading not to exceed 10 kg (22 lbs.).

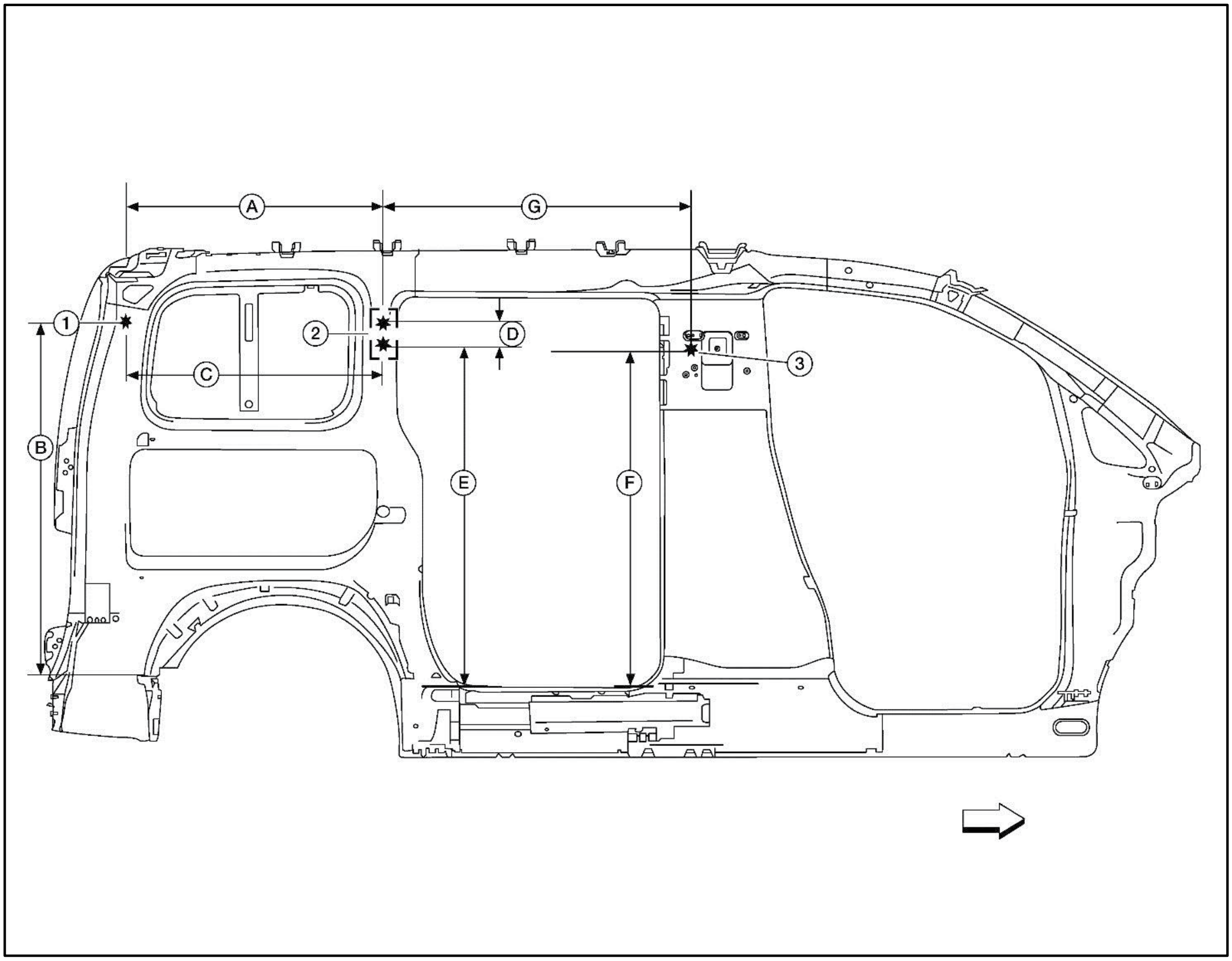
A. 925 mm (36.42 in) B. 1,091 mm (42.95 in) C. 1,035 mm (40.7 in)

D. 60 mm (2.4 in) E. 805 mm (31.7 in)   F. 1,092 mm (43.0 in) (from weld nut to metal floor)

G. 795 mm (31.3 in)

LH Body Side and D-pillar Inner

LH body side inner as viewed from inside the vehicle. Loading should be distributed evenly, utilizing as many mounting points as possible.



*Weld nut locations; All bolts are M8 x 1.25

1. Mounting point loading not to exceed 10 kg (22 lbs.).
2. Mounting point loading not to exceed 10 kg (22 lbs.) per point.
   (Total loading across these 2 mounting points not to exceed 20 kg (44 lbs.)).
3. Bulkhead mounting weld nut
   (Mounting point loading not to exceed 10 kg (22 lbs.). Point may be plugged with M8 bolt.)

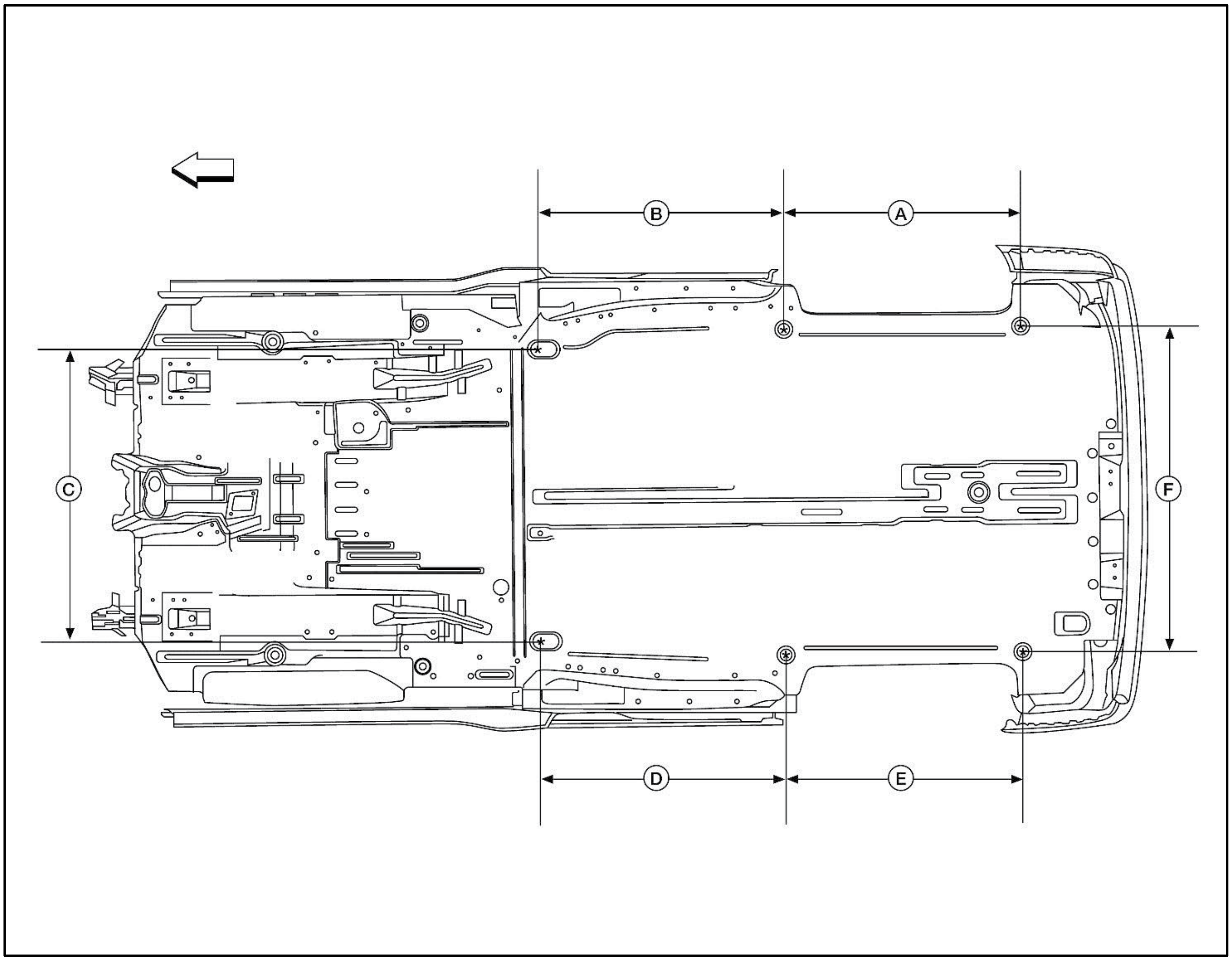
A. 795 mm (31.3 in) B. 1,092 mm (43.0 in) (From weld nut to metal floor)

C. 805 mm (31.7 in) D. 60 mm (2.4 in) E. 1,035 mm (40.7 in)

F. 1,091 mm (42.95 in) G. 925 mm (36.42 in)

Floor

The shelves bolt to the same location on the floor as the D-rings (if equipped). Loading should be distributed evenly utilizing as many mounting points as possible.



*Bolt locations for shelving installation; All bolts are M8 x 1.25

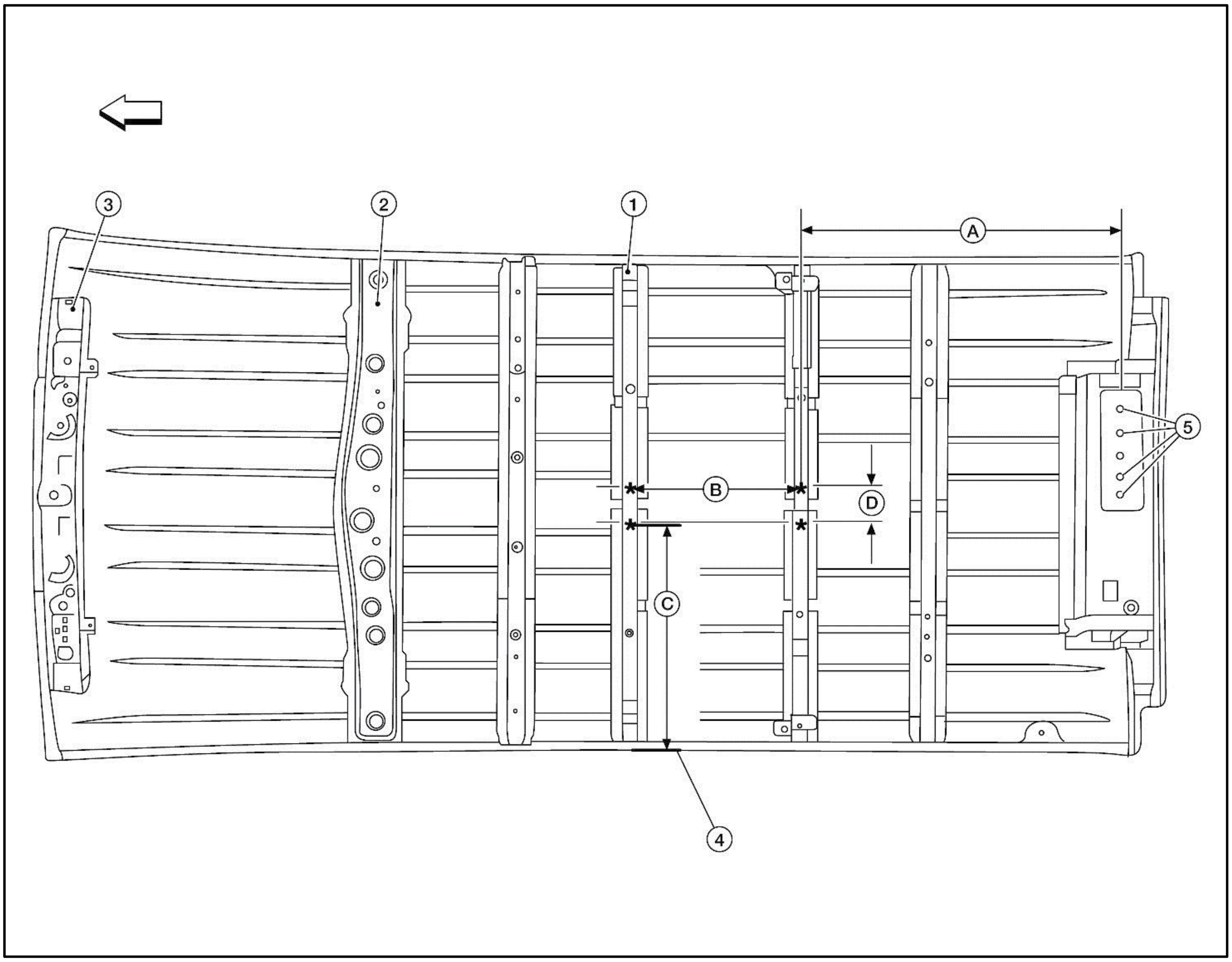
Mounting point loading not to exceed 10 kg (22 lbs.) per point.

A. 817 mm (32.2 in) B. 845 mm (33.3 in) C. 1,005 mm (39.6 in)

D. 840 mm (33.1 in) E. 817 mm (32.2 in) F. 1,138 mm (44.8 in)

Interior Roof Bow Mounting Points

Loading should be distributed evenly, utilizing as many mounting points as possible.



*Weld nut locations; All bolts are M6 x 1.0

Mounting point loading not to exceed 5 kg (11 lbs.) per point. Total loading across all 4 weld nuts not to exceed 20 kg (44 lbs.). Do not exceed a depth of 38 mm (1.5 in) for all 4 weld nuts.

1. Roof bow

2. Bulkhead roof bow

3. Windshield header

4. Slide door opening lower pinch weld

5. Rear door striker weld nuts.

A. 790 mm (31.1 in) B. 420 mm (16.5 in) C. 617 mm (24.3 in) D. 98 mm (3.9 in)

ROOF RACKS

WARNING:

• Drive extra carefully when the vehicle is loaded at or near the cargo carrying capacity, especially if the significant portion of that load is carried on the roof rack.

• Heavy loading of the roof rack has the potential to affect the vehicle stability and handling during sudden or abnormal handling maneuvers.

• Roof rack load should be evenly distributed.

• Do not exceed maximum roof rack load weight capacity.

• Properly secure all cargo with ropes or straps to help prevent it from sliding or shifting. In a sudden stop or collision, unsecured cargo could cause personal injury.

• To avoid personal injury, use care when placing or removing items from the roof rack. If you cannot comfortably lift the items onto the roof rack from the ground, use a ladder or stool.

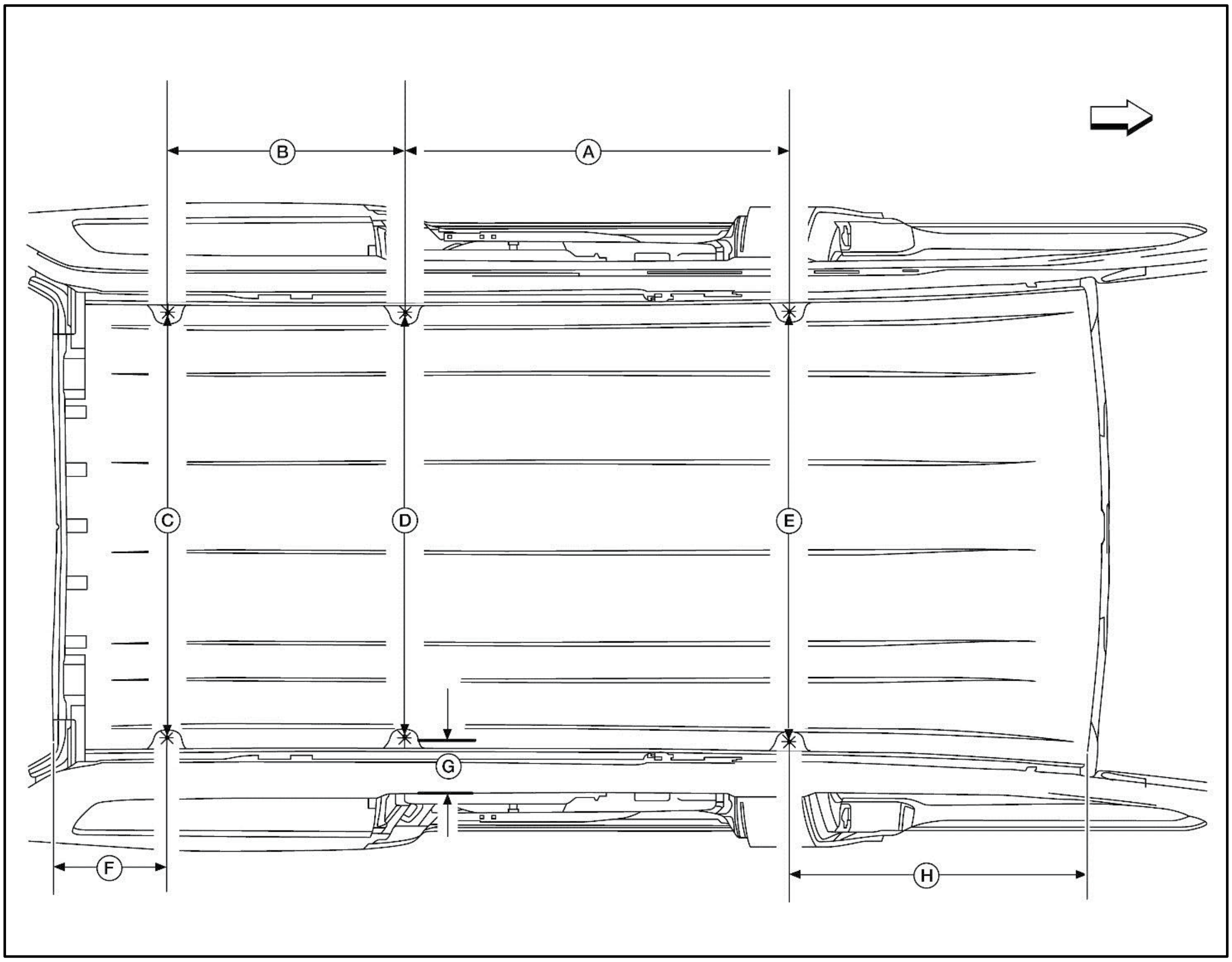
CAUTION:

Always distribute the cargo evenly on the roof rack. Do not load more than 100 kg (220.5 lbs.) for “LS” model and

101 kg (220.5 lbs.) for “LT” model utilizing all 3 pairs of roof rack mounting points. The maximum load per pair of roof rack mounting points is 33.3 kg (73.4 lbs.) for “LS” model and 33.6 kg (74.1 lbs.) for “LT” model.

The satellite radio antenna (if equipped) is located on the roof. Do not cover the antenna; it may affect the reception of the device.

The factory installed weld nuts are the only OEM approved attachment points for the installation of a roof rack. Use bolts for attaching the roof racks.



NOTE:

- Weld nut locations, all bolts are M8 x 1.25.
- For maximum load strength, ensure the bolt thread depth is at least 12 mm (0.5 in) depth.
- Do not exceed a depth of 24 mm (0.9 in) for the two front weld nuts.

A. 1,004 mm (39.5 in)
B. 630 mm (24.8 in)
C. 1,117 mm (44.0 in)
D. 1,113 mm (43.8 in)
E. 1,128 mm (44.4 in)
F. 214 mm (8.4 in)
G. 60.3 mm (2.4 in)
H. 800 mm (31.5 in).

CAUTION

To help prevent water leaks:

- Do not reuse plastic plugs or seals.
- Use High Performance Thread Sealant 999MP-AM002P, or equivalent (Permatex 56521 or Loctite 565) on bolts before installing.

RECOMMENDED FLUIDS AND LUBRICANTS

SPECIFICATIONS

RECOMMENDED FLUIDS AND LUBRICANTS

Description		**Capacity (Approximate)**			**Recommended Fluids and Lubricants**
		Metric	**U.S. Measure**	**Imperial Measure**	
Fuel		55 liters	14 gallons	$12^{1/8}$ gallons	Unleaded gasoline with an octane rating of at least 87 AKI (RON 91)*1
Engine Oil drain and refill	W/filter Change	5.1 liters	$5^{1/8}$ quarts	4 quarts	Engine Oil with an API Certification Mark of *2 Viscosity 5w-30
	w/o Filter Change	4.8 liters	5.0 quarts	4.0 quarts	
Cooling System	(with reservoir at max level)	0.7 liters	8 quarts	6 quarts	Pre diluted Genuine OEM Long Life Anti-freeze/Coolant *3
Continuous Variable Transmission		---	---	---	Genuine OEM CVT Fluid
Brake Fluid		---	---	---	Heavy Duty Brake Fluid *4 or equivalent DOT 3 (US FMVSS No. 116)
Multi-purpose Grease		---	---	---	NLGI No.2 (lithium Soap based)
Windshield Washer Fluid		4.5 liters	4 quarts	4 quarts	Windshield Washer Fluid
Air Conditioning System Refrigerant		450 ± 50 grams	.99 lbs. (± 0.11 lbs.)	.99 lbs. (± 0.11 lbs.)	HFC 134a (R-134a) *5
Air Conditioning System Oil		150 ± 20 milliliters	5.03 ± 0.7 ounces	5.03 ± 0.7 ounces	A/C System Oil Type “S” (DHPS) *6

***1**: For further details, refer to Precaution for Fuel.

***2**: For further details, refer to Engine Oil Recommendation.

***3**: For further details, refer to Engine Coolant Recommendation.

***4**: Available through a CHEVROLET dealer.

***5**: For further details, see “Air conditioner specification label” on the underside of the hood.

***6**: For further details, see “Air conditioner specification label” on the underside of the hood.

Precaution for Fuel (Unleaded Regular Gasoline Recommended)

Use unleaded regular gasoline with an octane rating of at least 87 AKI (Anti-Knock Index) number (Research Octane number 91).

CAUTION:

Do not use leaded gasoline. Using leaded gasoline will damage the three-way catalyst

Do not use E-85 fuel (85% fuel ethanol, 15% unleaded gasoline) unless the vehicle is specifically designed for E-85 fuel (i.e., Flexible Fuel Vehicle — FFV Models).

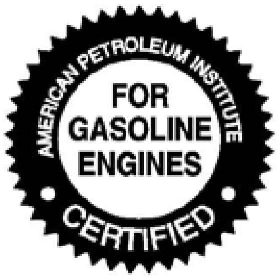
Using a fuel other than that specified could adversely affect the emission control devices and systems, and could also affect the warranty coverage validity.

Engine Oil Recommendation

General Motors recommends the use of a resource conserving oil in order to improve fuel economy. Select only engine oils that meet the American Petroleum Institute (API) certification and International Lubricant Standardization and Approval Committee (ILSAC) certification and SAE viscosity standard. These oils have the API certification mark on the front of the container. Oils which do not have the specified quality label should not be used as they could cause engine damage.

API certification mark **API service symbol**

①



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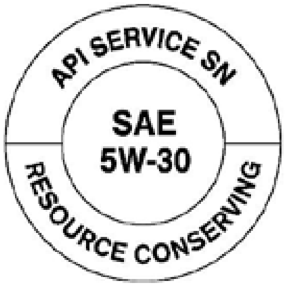


Engine Coolant Recommendation

The engine cooling system is filled at the factory with a pre-diluted mixture of 50% Genuine OEM Long Life Antifreeze/Coolant (blue) and 50% water to provide year round antifreeze and coolant protection. The antifreeze solution contains rust and corrosion inhibitors. Additional cooling system additives are not necessary.

Warning:

- **Never remove the radiator or coolant reservoir cap when the engine is hot. Wait until the engine and radiator cool down. Serious burns could be caused by high pressure fluid escaping from the radiator.**

- **The radiator is equipped with a pressure type radiator cap. To prevent engine damage, use only a Genuine OEM radiator cap.**

CAUTION:

- **When adding or replacing coolant, be sure to use only Genuine GM/OEM Long Life Antifreeze/Coolant (blue) or equivalent. Genuine GM/OEM Long Life Antifreeze/Coolant (blue) is pre-diluted to provide antifreeze protection to -34° F (-37° C). If additional freeze protection is needed due to weather where the vehicle is operated, add Genuine OEM long life Antifreeze/Coolant (blue) concentrate following the directions on the container.**

If an equivalent coolant other than Genuine OEM Long Life Antifreeze/Coolant (blue) is used, follow the coolant manufacturer's instructions to maintain minimum antifreeze protection to -34° F (-37° C). The use of other types of coolant solutions other than Genuine OEM Long Life Antifreeze/Coolant (blue) or equivalent may damage the engine cooling system.

- **Mixing any other type of coolant other than Genuine OEM Long Life Antifreeze/Coolant (blue), including Genuine OEM Long Life Antifreeze/Coolant (green), or the use of un-distilled water will reduce the life expectancy of the factory filled coolant.**

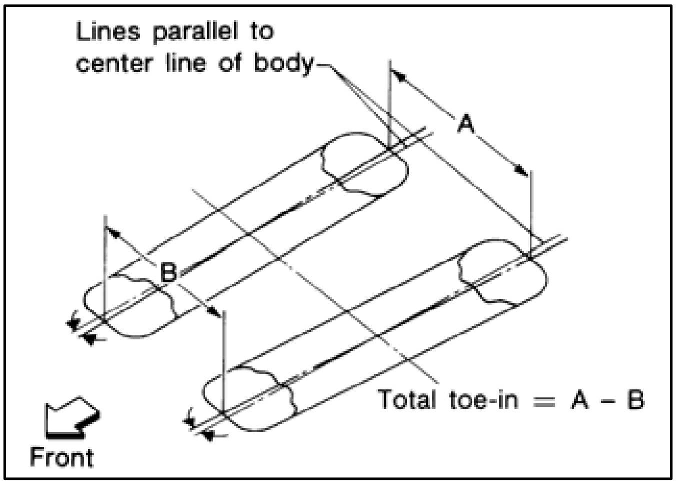
Specifications

SUSPENSION

General Specification (Front)

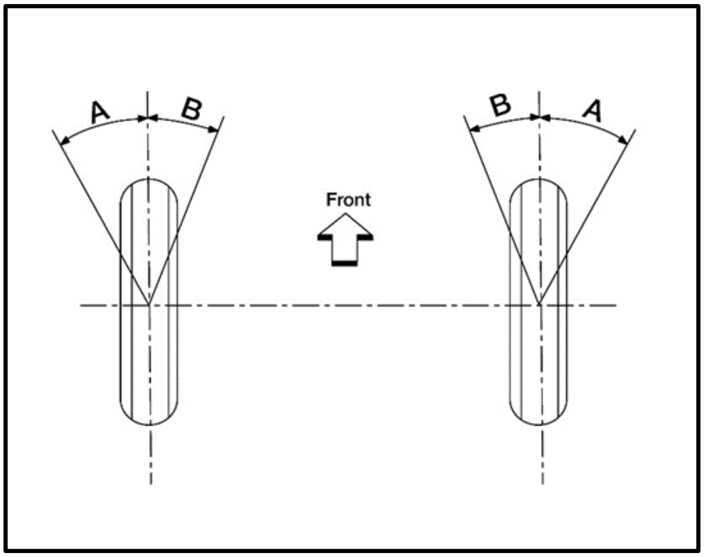
Suspension type	Front: independent strut Rear: multi-leaf with solid axle
Shock absorber type	Front: twin tube strut Rear: twin tube
Stabilizer	Front solid stabilizer bar (standard equipment)

Front Wheel Alignment (Unladen*1)

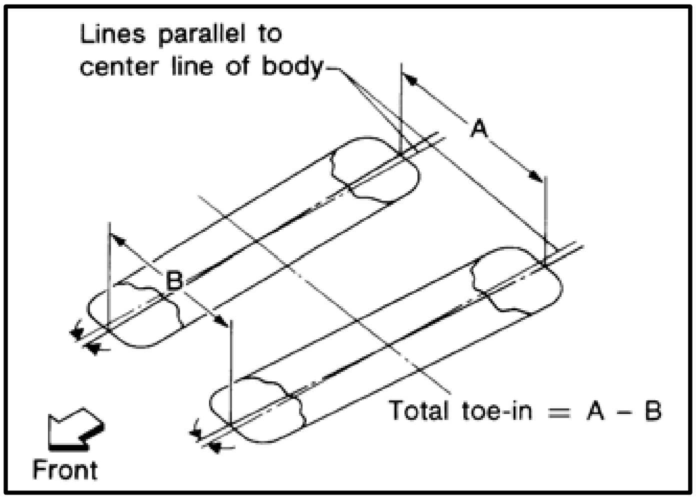
Camber *2 Degree minute (decimal degree)	LH and RH	Minimum	-1° 05′ (-1.08°)
		Nominal	-0° 20′ (-0.33°)
		Maximum	0° 25′ (0.42°)
Caster *3 Degree minute (decimal degree)	LH and RH	Minimum	3° 25′ (3.42°)
		Nominal	4° 10′ (4.17°)
		Maximum	4° 55′ (4.92°)
Kingpin inclination Degree minute (decimal degree)	LH and RH	Minimum	11° 10′ (11.17°)
		Nominal	11° 55′ (11.92°)
		Maximum	12° 40′ (12.67°)
 Lines parallel to center line of body A B Total toe-in = A − B Front			
Total toe-in	Total toe-in distance (A – B)	Minimum	Out 1.0 mm (Out 0.039 in)
		Nominal	In 1.0 mm (In 0.039 in)
		Maximum	In 3.0 mm (In 0.118 in)
	Total toe angle (LH & RH) Degree minute (decimal degree)	Minimum	In 0° 01′ (0.02°)
		Nominal	In 0° 06′ (0.10°)
		Maximum	In 0° 11′ (0.18°)

*1: Fuel, radiator coolant, and engine oil are full. Spare tire, jack, hand tools, and mats are in designated positions.
*2: The RH camber angle shall be 0° 0′ ±0° 45′ (0.0° ±0.75°) with respect to the LH camber angle.
*3: For the caster angle, the difference between right and left against the ground surface shall be ±0° 45′ (±0.75°) maximum.

Wheel Turning Angle

 		
Inner wheel angle (A) Degree minute (decimal degree)	Minimum	36° 55’ (36.92°)
	Nominal	39° 55’ (39.92°)
	Maximum	40° 55’ (40.92°)
Outer wheel angle (B) Degree minute (decimal degree)	Nominal	33° 35’ (33.58°)

Rear Wheel Alignment (Unladen*)

 Lines parallel to center line of body A B Total toe-in = A – B Front			
Camber* Degree minute (decimal degree)		Minimum	-2° 0’ (-2.0°)
		Nominal	-1° 30’ (-1.5°)
		Maximum	-1° 0’ (-1.0°)
Total toe-in	Total toe-in distance (A – B)	Minimum	Out 2 mm (0.079 in)
		Nominal	In 3 mm (0.118 in)
		Maximum	In 8 mm (0.315 in)
	Total toe-in angle Degree minute (decimal degree)	Minimum	Out 0° 13’ 12’’ (0.22°)
		Nominal	In 0° 16’ 48’’ (0.28°)
		Maximum	In 0° 46’ 48’’ (0.78°)

*: Fuel, radiator coolant, and engine oil are full. Spare tire, jack, hand tools, and mats are in designated positions

General Specification (Rear)

Suspension type	Rigid axle with semi-elliptic leaf spring
Shock absorber type	Double-acting hydraulic

WHEEL AND TIRE

Wheels and Tires

Grade	Road wheel	Tire Size	Spare tire size
LS	15X5.5JJ Steel	185/60R15C 94/92T *	185/60R15C 94/92T *
LT			

* Use commercial (C) rated tires only. Do not use passenger rated tires.

Wheel Dimensions	
Diameter	15 in
Width	168 mm (6.61 in)
Offset	45 mm (1.77 in)
Bolt pattern	5 x 114.3 mm
Center bore	66 + 0.1 mm / -0.00 mm
Lug nut thread pitch	M12 X 1.25
Brake caliper clearance	2.5 mm (0.10)

BULBS

Exterior Lamp

Item		Wattage (W)*	Bulb No.*
Front combination lamp	Turn signal/parking lamp	28/8	3457 NAK
	Headlamp low/high	60/55	Halogen H13
Rear combination lamp	Stop/tail lamp	27/7	3047K
	Turn signal lamp	27	3157AK
	Back-up lamp	16	921
High-mounted stop lamp		16	921
License plate lamp		5	T10

Interior Lamp/Illumination

Item	Wattage (W)*	Bulb No.*
Front room/map lamp	5	W5W
Cargo lamp	5	W5W

* Always check with your dealer for the latest parts information.

BATTERY

Application	Standard
Type*	GR21R
Capacity(20 HR) minimum V-AH	12 – 49
Cold Cranking Current A [For reference value at -18°C (0°F)]	470

ACRONYMS

ACRONYM LIST

Acronym	Description
2WD	Two Wheel Drive
ABS	Anti-lock Braking System
AC	Alternating Current
A/C	Air Conditioning
AKI	Anti-Knock Index
AM/FM	Amplitude Modulated/Frequency Modulated
API	American Petroleum Institute
ARC	Accessory Reserve Capacity
A/T	Automatic Transmission
AT	Auto Transporter
ATV	All-Terrain Vehicle
BCM	Body Control Module
BT	Bus Trailer
CAN	Controller Area Network
CAN-H	Controller Area Network – High
CAN-L	Controller Area Network – Low
CD	C-Dolly
CG	Center of Gravity
CMVSS	Canadian Motor Vehicle Safety Standards
DTCs	Diagnostic Trouble Codes
ECM	Engine Control Module
EGI	Electronic Gasoline Injection
EPS	Electric Power Steering
EVAP	Evaporative Emission
FCC	Federal Communications Commission (USA)
FFV	Flexible Fuel Vehicle
FMVSS	Federal Motor Vehicle Safety Standards
FSS	Front Sonar System
GAW	Gross Axle Weight
GAWR	Gross Axle Weight Rating
GCWR	Gross Combination Weight Rating
GVW	Gross Vehicle Weight
GVWR	Gross Vehicle Weight Rating
H.S.	Harness Side
HSS	High Strength Steel
HVAC	Heating, Ventilation, & Air Conditioning
IC	Inflatable Curtain
IDs	Identifications
ILSAC	International Lubricant Standardization and Approval Committee
IPDM E/R	Intelligent Power Distribution Module Engine Room
LDD	Load Divider Dolly
MH	Motor Home
MIL	Malfunction Indicator Light
MPV	Multi-purpose Passenger Vehicle
MSDS	Material Safety Data Sheet
NHTSA	National Highway Traffic Safety Administration
OEM	Original Equipment Manufacturer
ORVR	On-Board Refueling Vapor Recovery
OSHA	Occupational Safety and Health Act

Acronym	Description
RF	Radio Frequency
RFI	Radio Frequency Interference
RKE	Remote Keyless Entry
RPM	Revolutions Per Minute
SAE	Society of Automotive Engineers
SB	School Bus
SgRP	Seating Reference Point
SRS	Supplemental Restraint System
SUB	Second Unit Body
TCD	Trailer Converter Dolly
TCM	Transmission Control Module
TPS	Throttle Position Sensor
TRA	Trailer
TRU	Truck
TT	Truck Tractor
USB	Universal Serial Bus
UVW	Unloaded Vehicle Weight
VDC	Vehicle Dynamic Control
VIN	Vehicle Identification Number
VSS	Vehicle Speed Sensor